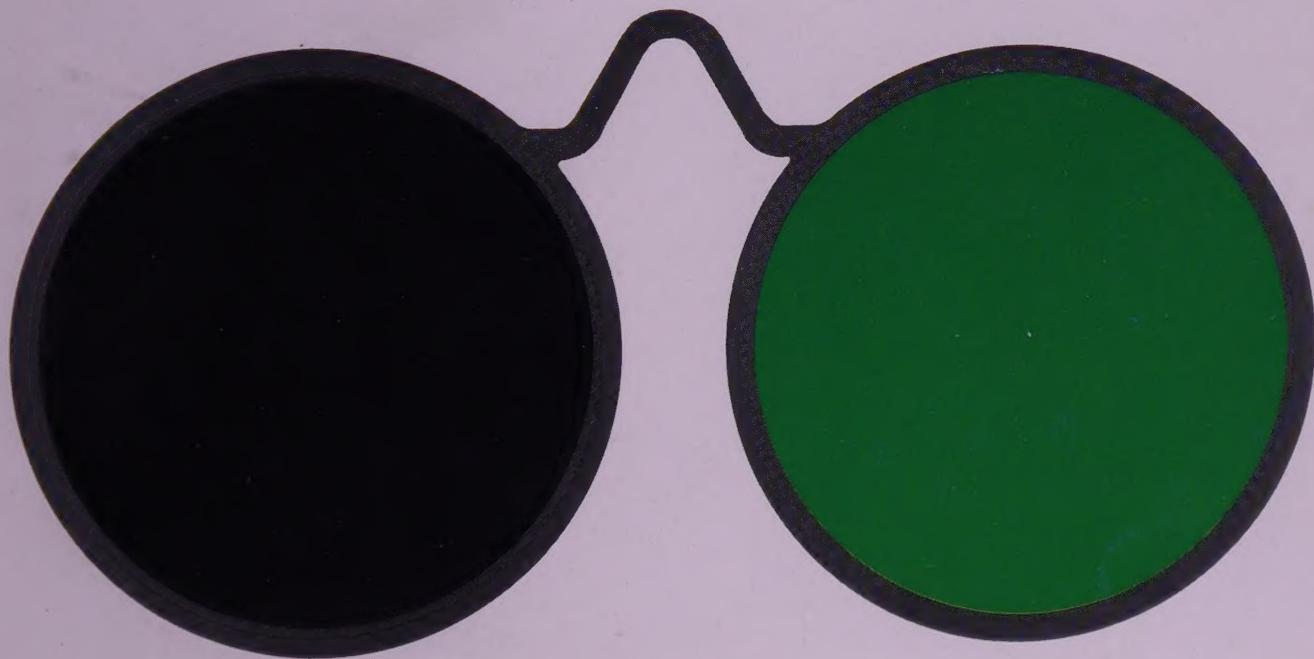


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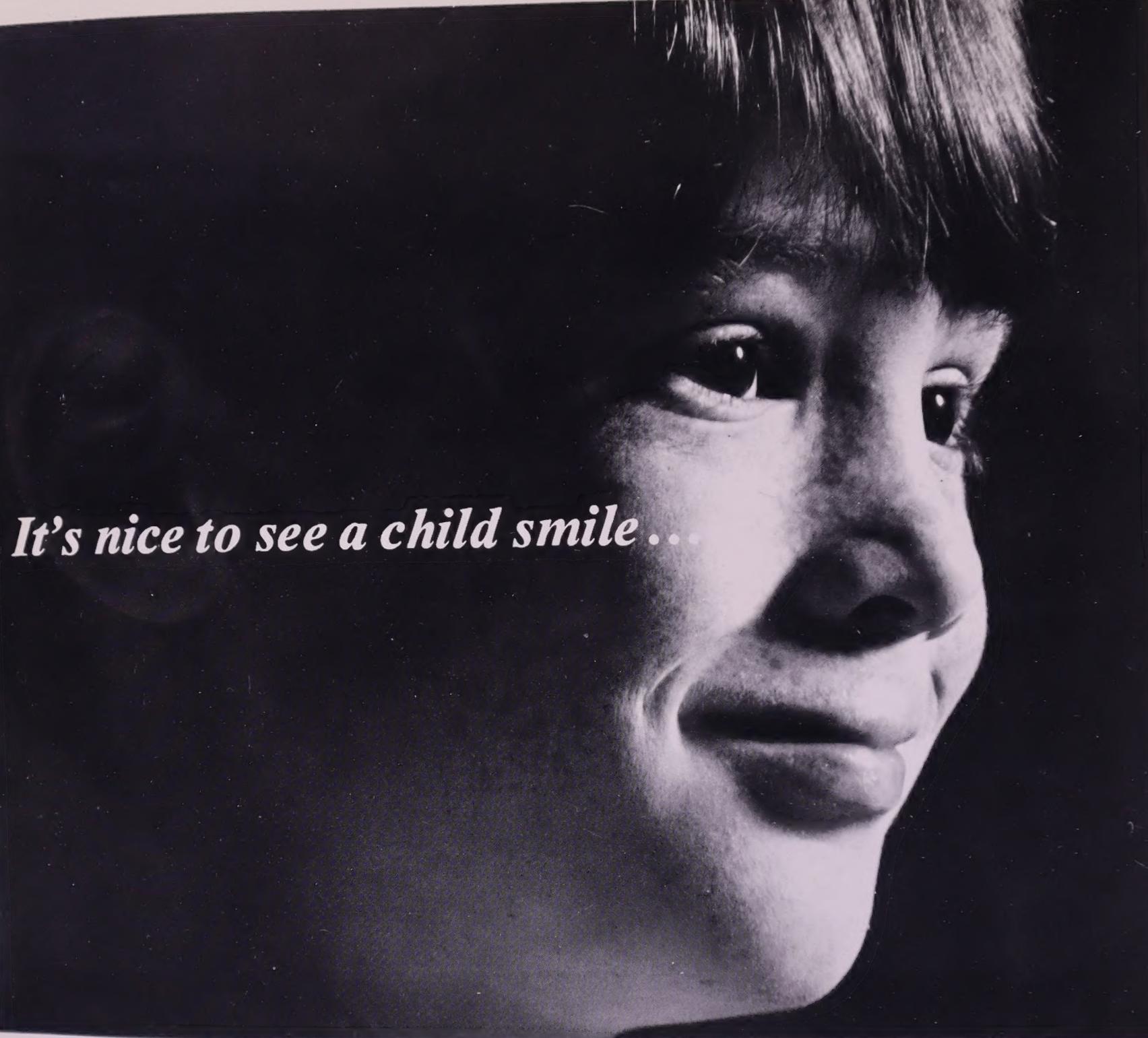
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## CERES

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□ Beginning with this first issue of 1973, readers will note that the subtitle on CERES' cover has been changed to "the FAO Review on Development." We hoped, in so doing, to define — more particularly for those not yet acquainted with our magazine — the precise domain it is striving to explore. Ever since CERES first appeared five years ago, it has been seeking ways to help meet one of the major challenges of this century: how to better the lot of the destitute rural masses. We were acting in harmony with the objectives of our Organization which aim, among other things, at "bettering the condition of rural populations; and thus contributing toward an expanding world economy and ensuring humanity's freedom from hunger." Accordingly, it was up to a magazine open to the many existing opinions and approaches concerning "how" to achieve this essential task, that often painful process known today as "development," to keep under scrutiny its most urgent aspects — economic, technical, social or cultural. □ In this current issue we present two points of view on the vast problem of nutrition. How to reconcile the limited food versus mouths-to-feed conflict vexes all those who are concerned about the world's present and future, and who wish to give the problem serious thought. Nutrition, a relatively new science, stands at the juncture of various important disciplines, such as medicine, agriculture, education, dietetics, demography and genetics, but also economics and sociology. In poor countries where whole societies are underfed or badly fed, problems of nutrition reflect the global situation; they are therefore a matter of capital importance. In this context, one is tempted to substitute the term "underfed" for "underdeveloped," just as one could substitute "fed" or "overfed" for "developed" or "overdeveloped." *Naim Kosaric* believes that chemical research and modern biochemistry are the only way to explore in depth the process of extracting proteins from unconventional sources, called biosynthesis (page 32). *Narendra Singh*, on the contrary, fears that such research might lead to solutions that threaten once again to neglect the worst-fed populations, the vast masses of peasants in the Third World (page 37). □ The "proletarian nations" are caught in a distressing situation because of the loans they have contracted. What will happen if their burden is made heavier by still more debts? *Angelos Angelopoulos* proposes a sort of new Marshall Plan — which should be promptly adopted by all those involved, the World Bank, the Monetary Fund, DAC and UNCTAD — designed to alleviate old debts and work out a new system of financing. Moreover, the author writes, it should behoove the United Nations to find an equitable solution to the gold plus-value problem (page 21). □ Few economists today would contest the priority that must be given to the employment sector in national development projects; this does not mean, however, that efficient measures are now being adopted or that all the consequences of such a concept are already perceptible. To give employment the dynamic role warranted by present conditions *K.C. Abercrombie* thinks we must not be afraid to demolish obsolete idols (page 45). There is a growing need to update conventional theories on manpower's specific role in economic growth in terms of the social reality of the developing countries characterized by a superabundance of perennially unemployed workers. □ In an exclusive interview for CERES, *Ernst Michanek* gives his advice on demographic policies which countries with rapidly expanding populations should adopt. It is wrong to say, he points out, that birth control is an invention of the rich (page 29). □ *Marc Ollivier* traces the agricultural decolonization process in Algeria (page 24), where not only the production structure had to be rebuilt but also new social relationships had to take root. The Algerian case shows that decolonization is not arrested with a declaration of national dependence; this, in fact, only marks its point of departure. □ It is a good deal more complicated to work as a Government agent in a new country than in a rich country, according to *Mahmood Aminul Islam*. The representative must first of all lead his community if development is to attain its ends (page 41). □ With this issue, CERES introduces a new department which will regularly publish descriptions of vacant FAO posts in the field and at headquarters.



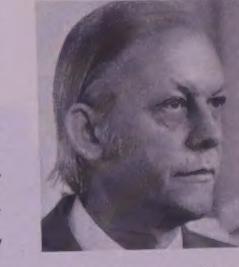
Naim Kosaric



Narendra Singh



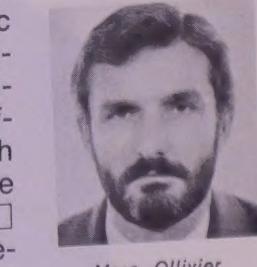
A. Angelopoulos



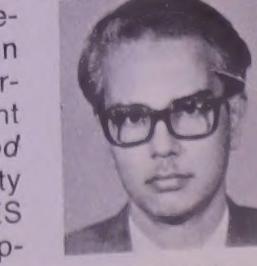
K.C. Abercrombie



Ernst Michanek

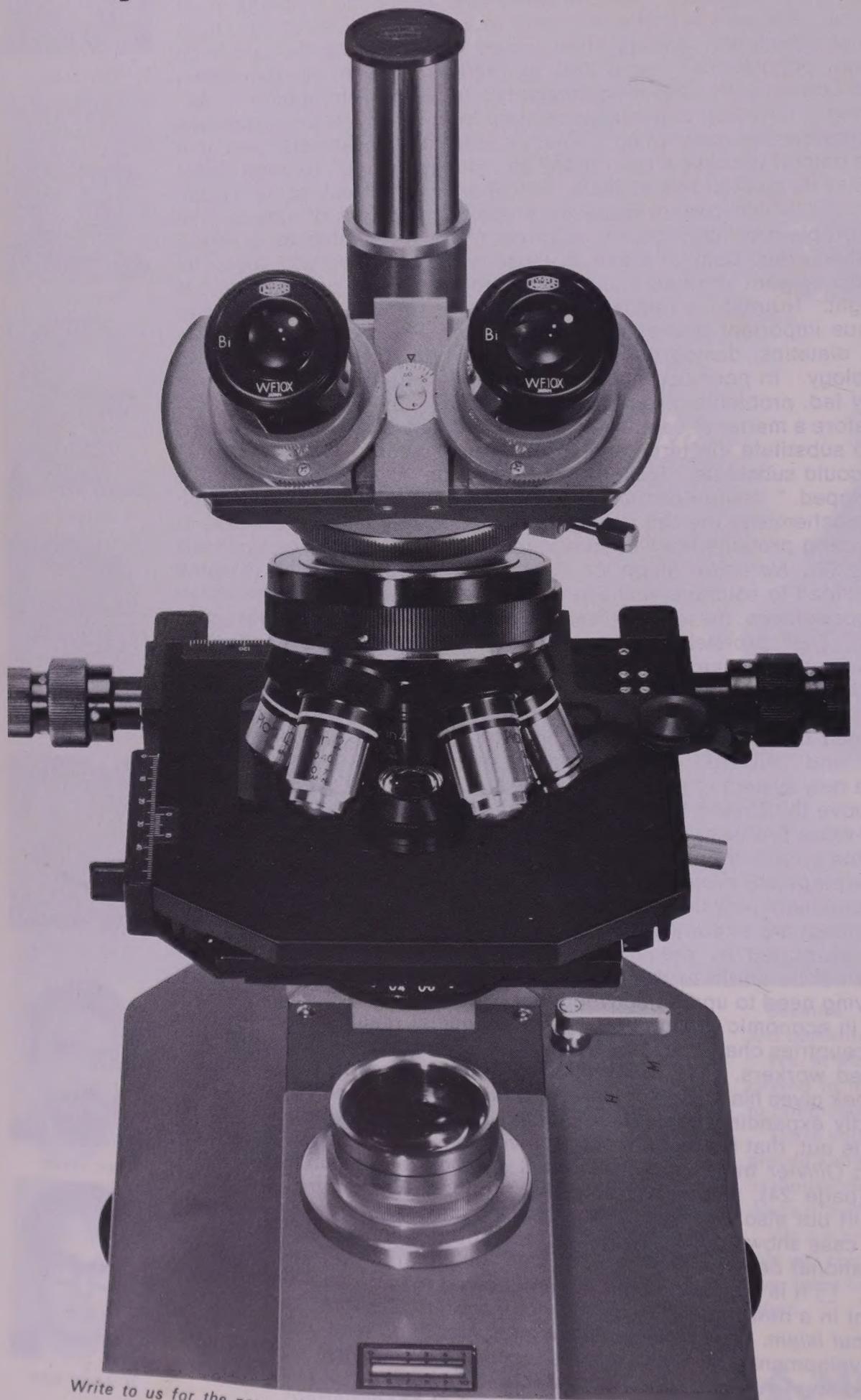


Marc Ollivier



M. Aminul Islam

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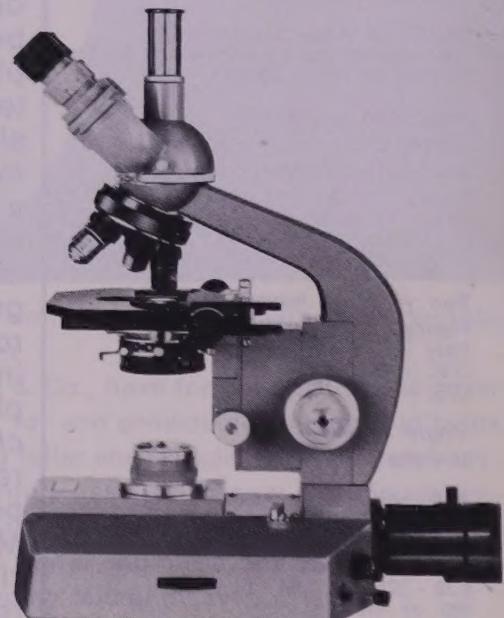


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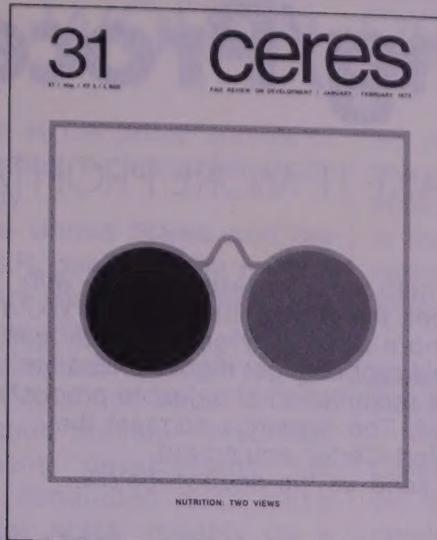
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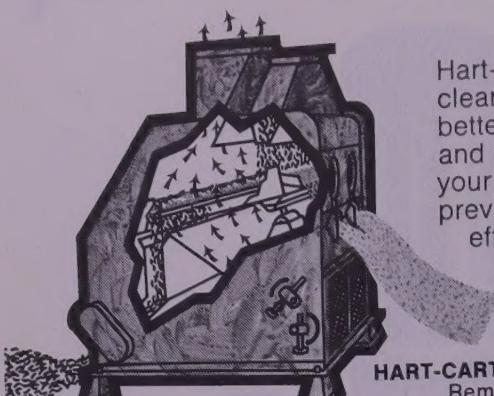


Problems of nutrition reflect the global situation; one can substitute the term "underfed" for "underdeveloped," the term "fed" or "overfed" for "developed"

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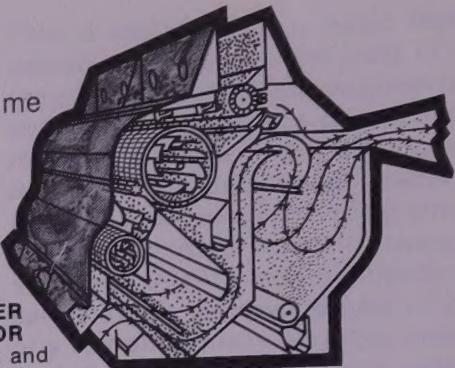
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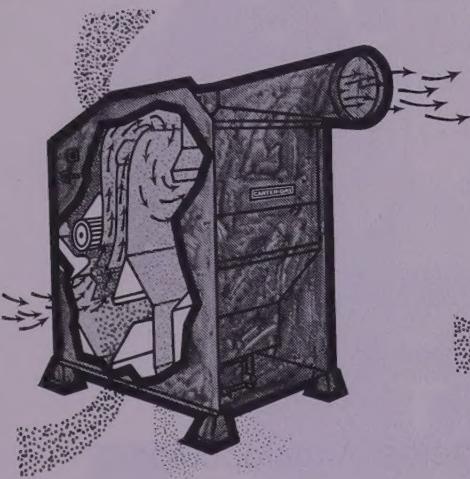
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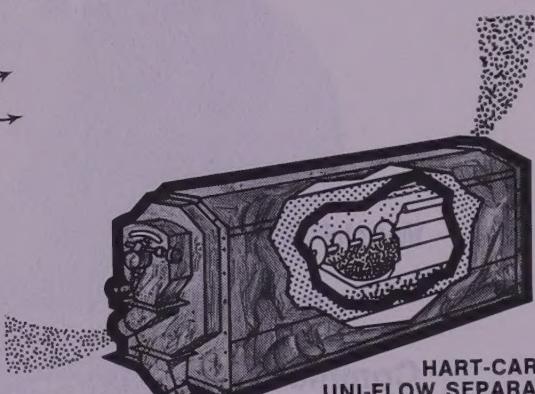
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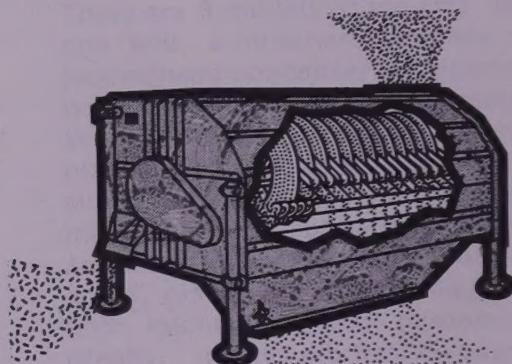
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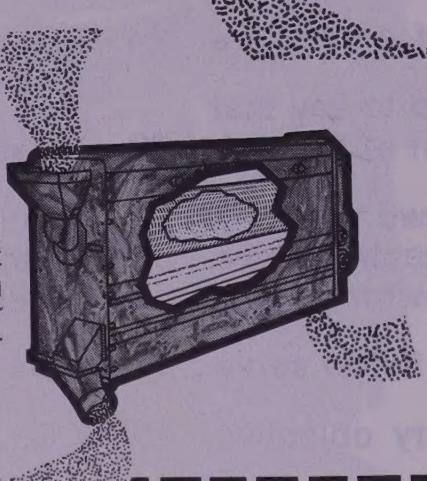
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# WORLD REPORT

## INTERNATIONAL

### ■ More scientists for military research

Weapons development and military-related scientific research occupy more scientists and engineers than any other single objective of current research and development efforts, according to the Stockholm International Peace Research Institute (SIPRI).

Despite recent increases in civilian sectors, such as pollution, environment and transportation, SIPRI said in a recent report entitled *Resources Devoted to Military Research and Development*, government-funded research

which is the prime source of advances in weapons technology.

The United States and the U.S.S.R. dominate the world's military research efforts, with outlays estimated to account for around 85 percent of the world total, or about \$13-14 thousand million. In China, weapons development has been conducted on a much smaller scale, roughly on a par with that in the United Kingdom, France, or the Federal Republic of Germany, SIPRI noted. These four countries account for a further 10 percent of the world military research spending. All the remaining countries of the

er, more deadly, and much more expensive types. The annual crop of new weapons is the product of military research and development efforts.

### ■ Downward trend worries FAO Council

The 34-member governing Council of FAO concluded its 59th session last December expressing "grave concern" over the trend in agricultural production which showed a global increase of only one to two percent in 1971, against a target increase of four percent.

The Council was also concerned that world agricultur-

Second Development Decade might be jeopardized.

Regarding various other actions by the Council, it examined the role of multinational corporations in the development process and some members felt lack of control had opened the way for powerful companies to commit veritably economic aggression against the developing countries. As many of these companies operated in the field of agricultural products, FAO was requested to take all necessary steps to cooperate with the United Nations Economic and Social Council expert group working on this problem.

### The extension gap

Farm families per extension worker in selected countries, 1971

Korea, Rep. of	414
India	828
Zambia	839
Chile	1 057
Venezuela	2 058
Senegal	2 176
Argentina	4 497
Brazil	5 543
Bolivia	8 165
Mali	8 436
Mexico	9 452
Uganda	11 458
Guatemala	15 679

Source: FAO.

remains heavily concentrated in the military area. Figures assembled by SIPRI show, for example, the following percentages of government research and development funds devoted to the military: the United States — 54 percent; the United Kingdom — 41 percent; France — 32 percent; Sweden — 31 percent.

During the last decade, the report said, the world spent about US\$15-16 thousand million annually on military research and development,

world combined represent only a small fraction of global weapons development efforts.

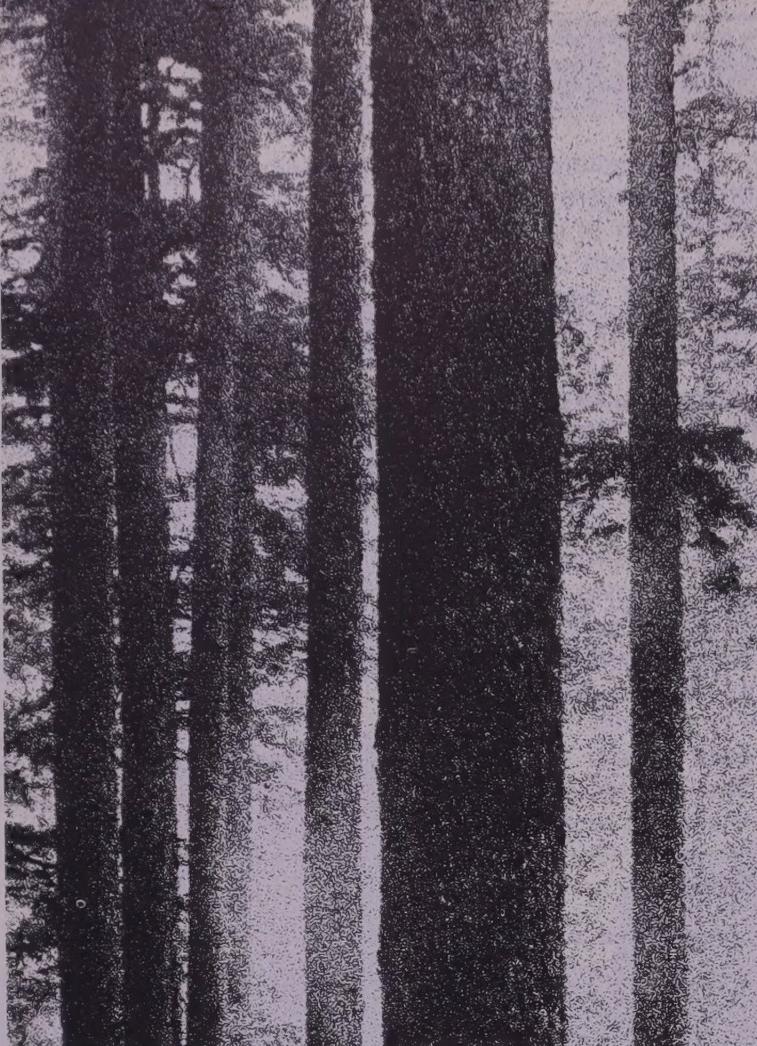
World military spending is constantly on the rise, but most of the increase is not caused by growth in the number of men under arms or in quantities of weapons. Instead, the SIPRI report states, the increased funds are absorbed by the continual replacement of existing weapons, which are considered "obsolete", within five to ten years of production, by new-

al trade in 1971 showed only a small improvement compared with the previous year, and that the share of agricultural exports in total world merchandise trade continued to decline.

As the agricultural export earnings of developing countries had declined in 1971, the Council felt that unless the recent production and export performance of the developing countries were radically improved, the objectives of the United Nations

In addition, the Council felt that FAO should continue to sharpen its priorities and give special attention to mobilization of human resources and agricultural development planning, particularly with regard to the needs of the 25 "least developed countries."

At the conclusion of its debate on "streamlining FAO," the Council expressed the conviction that the "crisis in confidence" toward the UN system, mentioned by the



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Council's Programme Committee in its report, would be overcome by effective leadership on the part of both the governing bodies and the management of the Organization.

### **■ \$24 million funded for agro-research**

Governments and organizations making up the Consultative Group on International Agricultural Research have indicated an intention to make approximately US\$24 million available in 1973 to finance international research programmes aimed at raising the quantity and quality of food production in developing countries of Asia, Africa and Latin America. The Consultative Group operates under the cosponsorship of FAO, the United Nations Development Programme, and the World Bank.

Most of the funds to be provided will support the on-

going work of one or more of six international agricultural research centres. These are: The International Rice Research Institute, situated in the Philippines; the International Wheat and Maize Improvement Centre, in Mexico; the International Centre of Tropical Agriculture, Colombia; the International Institute of Tropical Agriculture, Nigeria; the International Potato Centre, Peru; and the International Crops Research Institute for the Semi-Arid Tropics, India.

Each of these centres is carrying out research intended to be applicable or adapted in wide areas of the world. The Indian institute, for example, has a mandate to develop a programme for better systems of farming in tropical zones of low rainfall that cover large parts of Africa and South America as well as Asia; it will seek in the first instance to breed better

varieties of certain crops — sorghum, millet, chick-peas and pigeon peas — that are particularly suited to these areas.

### **■ Youth access to UN policy-making urged**

The United Nations is in danger of losing the interest and commitment of young people, a two-year study by the UN Secretariat has disclosed. The report comes at a time when demographers have estimated that more than 50 percent of the world's population is under 25 years of age and this percentage is increasing, particularly in developing areas.

Calling for new UN initiatives to improve communication with youth by opening up the system to young people's ideas and aspirations, the report sees a need for innovation in providing young people with greater access to the policy-making pro-

cesses of the world body. It calls for an *ad hoc* advisory committee on youth to advise the Secretary-General and to convey to the UN the views and interests of youth and youth organizations.

Two series of meetings between youth groups and the UN have already been held and the report suggests similar discussions should continue to provide working-level contacts between the Organization and youth representatives.

Young people under the age of 30 should be encouraged to enter and remain in the service of the UN, the report continues, and personnel policies should be redesigned to encourage the appointment of young staff members. A report on staff policies in the UN, in this connexion, has noted that only 4.6 percent of the UN professional staff is under 30 years of age.

## **Asian population conference draws development strategy**

The Second Asian Population Conference was held in Tokyo last November. It adopted a "Declaration of Population Strategy for Development," calling for intensive, innovative action to solve urgent population problems — not in isolation but as part of overall national and regional development. The following are some of the recommendations of the 23-nation conference:

### **Demographic situation and population change**

- population and socio-economic development should have co-ordinated and integrated status in national planning;
- family planning should be recognized as an essential means to achieving individual family well-being.

### **Manpower and employment**

- effective action should be taken, nationally and internationally, to help increase the exports of labour-intensive products;
- land reforms should occupy an important part in development plans.

### **Social aspects**

- social security schemes should provide an incentive to have smaller families;
- policies on the status of women should aim at reducing fertility levels;
- funding of education should be revised to make the local community aware of the high cost of facilities in the face of rapid population growth.

### **Family planning**

- governments of developed and developing countries should encourage the small-family norm;
- further research is desirable for more effective, cheap and acceptable methods of contraception;
- each country should evolve possible incentive schemes to couples, communities, local and state governments for expediting the realization of demographic goals.

### **Ecological implications**

- studies should be undertaken to gain a better understanding of such problems as migration, pollution, infrastructure, city-hinterland relationships and regional planning in view of the extremely limited information on the interrelationship between population and environment;
- inventories of natural resources, especially where population pressure on land and water is greatest, are needed.

### **Research and training**

- studies should be made of the factors influencing decisions on family size and how social change affects family and individual welfare;
- a career structure for family planning workers should be set up;
- facilities for the dissemination of population knowledge should be established.

The report of the conference will be submitted to the World Population Conference to be held by the United Nations in 1974 as part of World Population Year.

# 75

# VERONA FAIR

11/19  
march  
1973



INTERNATIONAL FAIR OF AGRICULTURE & ANIMAL HUSBANDRY - 26th SALON OF AGRICULTURAL MACHINERY - 5th SALON OF NEW TECHNIQUES

The Verona Fair, to be held between 11 and 19 March, will celebrate its 75th anniversary this year.

This period coincides with the evolution of agriculture in modern times, which commenced with the introduction in Europe and the United States of new agricultural machinery and methods at the end of the last century.

Since those early days, the Verona Fair has been the pioneer in promoting all advances and innovations in the agricultural field. A landmark in this activity was the creation of the Salon of Agricultural Machinery in 1948, which from the start attracted the interest and participation of manufacturers, technicians and experts. Today, after 75 years of activity, we hold a unique position in the world of experience and knowledge.

The international character of the Verona Fair offers to farmers in all continents, no matter what language they speak, an opportunity to see the newest and best equipment for fulfilling any need anywhere in the world.

The Fair is organized in three main sectors, in which thousands of exhibitors from Italy and other countries are present:

● **AGRICULTURE:** food and agricultural products; seeds, horticulture and nursery gardening; chemical products, rural constructions; rural handicrafts.

● **FARM MACHINERY:** tractors, agricultural equipment, equipment for land reclamation; machinery for distributing manures, sowing, planting and plant protection; threshing and treatment of agricultural products after harvesting; equipment for irrigation and irrigation of fertilizers; loading and transporting equipment; machinery for processing agricultural products (wine, oil, dairy, flour and bread industries; for refrigeration, conservation, treatment of wood, etc.).

● **ANIMAL HUSBANDRY:** material and products for animal husbandry; equipment for animal and poultry rearing; feeds, supplementary feeds; incubators; veterinarian products.

During the 75th Verona Fair several commemorative events will be held: congresses, meetings and conferences with the participation of experts, researchers and technicians of international repute.

"Business Days" on 13-16 March will be reserved for the Italian and foreign businessmen in the field of agriculture.

In 1972 the number of participants at the Verona Fair was 4 812 representing 38 countries: 2 192 participants at the International Fair of Agriculture and Animal Husbandry, 1 489 at the Salon of Agricultural Machinery and 1 131 at the Salon of New Techniques.

# WORLD REPORT

## LATIN AMERICA

### ■ \$5.4 million d-loan for Andean group

The six nations of the Andean group — Venezuela, Colombia, Ecuador, Peru, Bolivia, and Chile — are to be the beneficiaries of a US\$5.4 million IDB loan to help foster their economic integration.

The borrower, the Corporación Andina de Fomento (CAF), is a regional development bank created by the Andean group. CAF will lend at least \$4 million of the IDB funds for economic integration projects being carried out in the two lesser developed countries — Bolivia and Ecuador. The remaining \$1.4 million will help finance feasibility and complementary studies, including final design, or industrial, marketing and transportation projects of an integration nature within the six nations.

The IDB has also extended \$750 000 in technical assistance to CAF.

The Andean subregion has an estimated population of 65 million in 1970 and accounted for approximately 25 percent of the gross domestic product of Latin America as a whole, roughly equal to that of Mexico.

### ■ IDB lends \$165 million to eight countries

The Inter-American Development Bank (IDB) has announced loans totalling US \$165.76 million to Bolivia, Brazil, Colombia, Mexico, Nicaragua, Panama, Peru, and Trinidad and Tobago.

Bolivia is to receive \$13.7 million to help finance the construction of a modern express highway between La Paz and El Alto, site of the city's international airport.

Brazil will get several IDB loans: one of \$10 million to improve and expand Rio de Janeiro's water supply system; and the others, amounting to \$57 220 000, to help expand electric power production in

the northeast part of the country.

Colombia is to be the recipient of \$44 million for a major urban development programme in Bogotá, affecting power, paving, health, social fields, housing, sanitation, education and other areas. Mexico's loan provides \$23.1 million for developing more efficient irrigation techniques, which will recover some 1.6 thousand million cubic metres of water annually currently being lost through inefficient operations on 1.6 million acres of land. This water will be used to irrigate an additional 339 625 acres.

\$240 000 credit line to finance the sale of a fishing vessel to Colombia.

Trinidad and Tobago will get \$3.7 million to help finance university studies in fields directly related to social and economic growth.

The Republic of Korea will get \$20 million for developing industrial enterprises in the private sector, particularly for financing foreign exchange requirements.

Malaysia will get \$6.1 million for a project in Perak State, West Malaysia, involving the extraction of 20 million gallons of water daily from the Perak River.

A loan of \$2.7 million will go to Nepal for power development, including the construction of 150 km of transmission lines from the Gandak Power Station to Hetauda, with a substation to be built at Sharatput.

## ASIA

### ■ Nine nations to get \$109 million

Development loans amounting to US\$109.05 million to Indonesia, the Republic of Korea, Malaysia, Nepal, Pakistan, the Philippines, Singapore, the Republic of Vietnam, and Western Samoa

## Asia's thinner slice

Share in world agricultural exports of the Far East<sup>1</sup>

Year	Total agricultural exports - value indices		Far East share in world	Export of twelve <sup>2</sup> major commodities - value indices		Far East share in world
	World	Far East		World	Far East	
	<i>1960-62 = 100</i>		percent	<i>1960-62 = 100</i>		percent
1960	98	104	15.6	100	104	37.9
1961	101	99	14.4	99	99	36.2
1962	101	97	14.2	101	97	34.8
1963	114	107	13.9	115	107	33.7
1964	124	106	12.6	122	105	31.2
1965	123	104	12.5	121	103	31.0
1966	126	101	11.8	121	99	29.7
1967	124	98	11.6	122	95	28.3
1968	126	100	11.7	127	94	27.0
1969	131	102	11.4	129	97	27.5
1970	151	106	10.4	145	99	24.7
1971	159	111	10.3	147	102	25.1

<sup>1</sup> Excluding Japan, China and other centrally planned countries. <sup>2</sup> Rice, maize, sugar, copra, palm oil, coconut oil, coffee, tea, tobacco, rubber, jute, oilseed cake and meal.

Source: FAO.

Nicaragua will receive \$12.5 million for improved water supply and sewage systems in 74 cities and rural committees, affecting 347 600 persons.

Panama will have \$1.3 million in IDB funds to improve farm and livestock production through a credit and marketing programme for small- and medium-scale farmers and ranchers.

Peru is to receive a

have been announced by the Asian Development Bank (ADB). In addition the Bank will provide technical assistance to Nepal and Singapore.

Indonesia is to receive two loans: one of \$2.6 million for its Pekanbaru Power Project in Riau Province, Central Sumatra; and \$5.5 million for a project providing for the rehabilitation and modernization of existing port facilities in Surabaya, East Java.

Pakistan is to receive \$26.5 million, also for power generation in and around Karachi, the country's major industrial and economic centre.

Funds amounting to \$22.25 million will go to the Philippines to finance the foreign exchange cost of the construction and improvement of the Iligan-Cagayan de Oro-Butuan Road in Mindanao — 310 km long.

Singapore will get \$14.5

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million to expand the facilities of the country's telecommunications system, notably the installation of 88 000 telephone exchange lines.

Viet-Nam will receive \$6.3 million for the development of the power system in Saigon, the largest city in the Republic. The project includes the construction of two main substations with 147 km of distribution lines.

Finally, Western Samoa is to receive a loan of \$2.6 million for improvement and expansion of existing domestic and international telecommunications services.

#### **■ Need for small-scale industry stressed**

Intensified development of small-scale industries could help absorb Asia's growing labour force, take maximum advantage of the Green Revolution and raise living standards, according to a recent statement of the Economic Commission for Asia and the Far East (ECAFE).

The main objectives of the development of small-scale industries, ECAFE said, are to create more employment, to redistribute economic power and income, raise living standards, and decentralize industries. Emphasizing the need for the development of agro-based and rural industries, the Commission said that the general increase in the productivity and volume of foodgrain output "open up many new opportunities for industrialization." The Green Revolution is making more agricultural raw materials available for processing in agro-based and food industries in rural industries, it said, while opportunities will also arise for the production of the tools and equipment required at all stages of agricultural output.

In many developing countries, the statement noted, "the release of surplus agricultural labour as a consequence of the Green Revolution, coupled with rapid pop-

ulation growth, has thrust a great burden on the economy, which has to create new employment to absorb new entrants in the industrial labour force." Labour-intensive techniques were therefore required, and small-scale industries serving this purpose could be established with relatively little capital and less sophisticated tech-

lion agriculture programme. The programme is designed to bring about important foreign exchange savings through greater domestic crop production and increased exports. While 80 percent of the population derives its living from the land, mostly by subsistence agriculture, 80 percent of exports are diamonds and mineral ores.

and farmers will be trained in modern techniques.

The three-year project is being assisted by the World Bank group.

#### **■ The conquest of Malagasy's desert**

The Malagasy Republic is embarking on a US\$27 million irrigation and rural development programme, designed to develop new regions for settlement and irrigated agriculture in the semi-arid Morondava region of the island-nation.

The project provides for the resettlement of about 2 100 families, development of state farms, construction of roads and villages, establishment of a new research station, and implementation of a health programme.

Seeking to improve the country's agricultural output and to help correct a maldistribution of the population, the project grew out of a five-year study by FAO and the United Nations Development Programme (UNDP). Some 60 percent of the people live on 20 percent of the total land area of Malagasy, mainly clustered on the humid central plateaus and on the east coast where population densities reach more than 100 persons per square kilometre. By contrast, the Morondava region in the southwest is sparsely populated, with densities of less than five persons per square kilometre.

Among the FAO-UNDP recommendations now being translated into action are: construction of a diversion dam at Dabara on the Morondava River; rehabilitation of about 40 miles of main canals; a gravity irrigation and drainage system on 16 330 acres; a sprinkler irrigation system on 6 670 acres; on-farm development; construction and improvement of about 55 miles of roads; construction of project buildings and ten new villages, and the expansion of ten existing villages.

### **DDT benefits outweigh risks**

*The benefits from the proper use of DDT are greater than the risks, according to an international group of experts who met recently to evaluate the possible hazards to man arising from the occurrence of residues of pesticides in foods.*

*The scientific group held that the benefits lie in the prevention of food losses to pests that would be disastrous for food supplies in developing countries. Opposed to this is the risk that the increase in pesticide residues in the biosphere may have environmental and health consequences which are still to be scientifically established.*

*After sifting evidence received since they met last year, the experts said in their report that "the benefits to man arising from the proper controlled use of DDT will outweigh the possible risk from exposure." They agreed to maintain the acceptable daily intake for man of 0.005 milligramme per kilogramme of body weight, conditionally established in 1969.*

*The mercurial organic fungicides used in seed dressings were among the many other compounds reviewed by the group. It pointed out that "mercury used in agriculture represents only a very small proportion of the total released into the environment," and that "uptake of mercury into crops from dressed seed is insignificant." But as there had been serious cases of human poisoning caused by the diversion of dressed seed to consumption by man or animals, further study should be given to the possibilities of replacing them where possible by safer substances.*

*The group serves in an advisory capacity to the Codex Alimentarius Commission, a joint body of the World Health Organization and FAO, which is engaged in establishing international food standards and securing their acceptance by governments.*

nology. It pointed out that Malaysia, India, and other countries in the region had already recognized the importance of small-scale industries.

### **AFRICA**

#### **■ Sierra Leone to diversify**

Sierra Leone, where foreign exchange earnings have been dominated largely by diamond production, is now attempting to broaden the basis of its economic growth through a new US\$5.6 mil-

The new project will involve integrated rural development with a parallel strengthening of services and Government agricultural institutions. Specifically, it provides for the planting of about 500 acres of oil palm to complete development of an oil palm estate. It also provides for smallholders' credits to help bring 6 000 acres of swamp into rice production and to plant 750 acres of cocoa and 1 830 acres of oil palm. A palm oil mill and rice mills for processing these products will also be set up



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# OPINION

## Multilaterals with soul

Paul Gérin-Lajoie, President of the Canadian International Development Agency, in a paper entitled "Developmental Administration":

There is a wider motive for our decision to become more deeply involved with the work of multilateral organizations. If a fundamental objective behind international cooperation in development is the working out of a new form of world society, and the implementation of plans in the developing countries in accordance with their own national objectives, then we should provide the most active support to international organizations. For by definition these organizations do not have any axe to grind or any wish to exert a preconceived selfish orientation on development programs in any country. If we pushed this reasoning to an extreme, of course, we would reach the point of saying that all of Canada's contribution to international development should go through multilateral organizations. But I am a believer in diversification as the best basis of cooperation with foreign countries: through diversification you have a better chance of avoiding the risks of waste and inefficient operations, and a better chance therefore of achieving the ultimate purposes which we share.

But, having said that, I will add that our participation in international organizations is of the utmost importance to us in two ways. First, because they provide a worthwhile channel to collect all possible sources of funds and talents to achieve specific purposes. Secondly, because fuller participation gives Canada and Canadians an opportunity to influence the policies, the orientation and the activities of these organizations. It is important for all members to have an input; but, in this field as in any other field there will always be members who are more active and have more initiative than others, and who will on account of circumstances exert more influence. Since we in Canada have a conception of our own about development and the

shaping of a new society, we should do more than provide funds: we also have a responsibility to help in administering a system which can have no soul — and is nothing — until men give it some kind of orientation and make it work in practice.

## Shaky model

Wajib-ud-din Ahmad in *Birthright*, a publication of the Family Planning Association of Pakistan:

When a community gets involved in the process of determining its size, it thinks primarily about the "carrying capacity" of its environment. Ecological realism provides a rationale quite different from what population economists usually suggest. An assured level of consumption is the deciding factor, not the potential for saving and investment. And this, I feel, is a far more sensible approach than the abstract argument, based on the economists' linear "growth model."

The "growth-through-investment" case for population limitation is quite shaky. I do not pretend that I am convinced. The argument is roughly like this: Fewer children will mean lesser consumption, which sequentially will lead to a higher level of saving, greater investment, more production and rise in living standards. There is no evidence to show that one effect would predictably follow the other. Theoretically, things can go wrong at several points. A lighter dependency burden may enhance consumption rather than saving on the part of individuals (or governments). Savings may not get easily siphoned into investments in underdeveloped and fragmented economies. Investments may be poorly productive or may not relate to social (as distinct from economic) goals.

Exchange value of products may fall in foreign markets. Benefits of economic growth may be distributed so unevenly as to have little effect on general living standards. Many breakages are possible in this long chain of events.

## Shattered assumptions

Leonard Silk, of the editorial board of the New York Times, in the Saturday Review:

Economists once thought, for instance, that to bring a backward economy into the modern age, the essential job was to transfer gobs of capital to it. This, many now agree, was a laughably inadequate answer. The range of social, psychological, educational, organizational, managerial, political, and even moral complexities involved in economic development has shattered the simplistic assumptions of conventional economists. Similarly the persistence of poverty and the worsening of many social and environmental problems in rich, highly developed societies have forced economists to question the adequacy of their tools for improving human welfare — the classic aim of economics.

In my view, economics unquestionably needs a more realistic conception of human welfare itself than is provided by data on income and output. "What constitutes the well-being of a man?" Carlyle asked in 1839. Wages and the amount of bread his wages will buy, Carlyle answered in part, acknowledging two major areas of economic concern. But these, said Carlyle, were only the preliminaries . . .

Commodities, such as justice and opportunity and friendship, are hardly touched upon by the usual arid arithmetic of economics. But economists are beginning to recognize such factors as being as central to real well-being as those that are more readily fitted with price tags.

## Kept promises

American economist Vassily Leontief, lecturing in Paris on China, from which he had recently returned, as quoted by *Le Monde*:

Modern techniques (chemical fertilizers, tractors) are being introduced gradually and prudently; the same is true of

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industrial activities in the rural districts, where the failure of the villagers' blast furnaces has taught a stern lesson. Still, these activities are important. In a community I visited 200 kilometres from Shanghai, small industries — basketry, fertilizers, farm machinery, electric bulbs, etc. — were employing 25 percent of the available manpower and accounting for 50 percent of the town's revenue.

Certainly, if these enterprises were operating in one of China's big industrial cities, they would be more profitable, but their situation in the countryside has made it possible to forestall a rural exodus. Here industry reaches out to manpower, not vice versa. This is a wholly reasonable approach.

We Western economists make a distinction — an almost theological distinction — between public and private property. Private property, we believe, manages itself. If a proprietor goes broke, that's entirely his own affair; he alone is responsible. If public property or any public project fails, the consequences are infinitely more serious. It demoralizes the people. At such a time, each individual is tempted to put the blame not only on the efficiency of the planners but also on the quality of his neighbour's efforts. Each man then tries to work as little as possible and to profit from the others. That's only human.

No project, therefore, must ever be deceptive. In Cuba, the authorities prodded the workers into making their maximum efforts by promising them the earth, but failed to keep their promises. Indeed, how could they? In China, no one has aimed for either the exceptional or the illusory, no one has promised great things. But every promise made has been kept.

### Global tax

Takeshi Watanabe, former president of the Asian Development Bank, in his retirement speech:

For too many years, development was in large part a facet of international cold war politics. Developed countries gave aid in the expectation of gaining some political advantage. Developing

nations played one power against the other looking for the maximum economic gain.

At the height of the cold war, the game worked to some extent, though I feel it produced as much mutual resentment as it did cash flow. Now, however, the cold war has grown tepid. The game has faded away.

At the same time, it has become increasingly evident that much of the money previously poured into development was, in effect, wasted. We have come to a realization that huge "show" projects usually have little to do with sustained development, and that too much a money has ended up in the pockets of a privileged few whose personal "development" has done little for the progress of their countries.

We must go back to the real purpose of development. That purpose is simply a better life and better opportunities for those born in countries that have not far been able to share in the human achievements made available to the developed world . . .

I believe the problem of increasing development aid must be met head-on. When a single country finds a need to close the gap between its rich and poor, it turns to its tax system.

In the international community of sovereign states there is now no authority for imposing such a tax for the benefit of the world's poor. But such a concept, a true feeling that national boundaries have little meaning before international needs, must come if aid is to be put on a truly rational basis.

I am too pragmatic to believe that a World State administered by a World Government is likely at any time in the near future. But national sovereignty can no longer be all-mighty in today's world. The Stockholm Conference taught us that we have "only one earth" and that each nation must limit its actions if we are to preserve our planet from ecological disaster. The hazards of international poverty are as great as the economic world has become as tary, as the environmental one.

At the close of a six-year career in an international development bank, I am fully convinced of the need

greatly increased aid. I am further convinced that it is the responsibility of the international community, especially its more affluent members, to join together to find a way as systematic as national tax systems to provide those funds.

### Three-dimensional change

Robert E. Hunter, James P. Grant, and William Rich, in a paper published by the Overseas Development Council:

To meet the problems of poverty, unemployment, and the dearth of such social services as health care and education, there must be a series of structural reforms — not just little projects here and there that get at the symptoms of what is wrong with society, but basic, far-reaching reforms to make social, political, and economic structures responsive to needs.

A land tenure reform programme, for example, requires a shift in the balance of economic power from landlords to tenants. A decent health system in a poor country requires changes in doctors' professional attitudes and standards, which have been set by the developed countries, to allow the use of less costly paramedics...

The issue of structural change has two other dimensions. First, it is correctly believed that development will contribute to conditions of lasting peace. However, many commentators have distorted this idea, interpreting it to mean that development can only be ensured by stability — i.e., no disturbance to existing political, economic, and social structures. Yet such a requirement ultimately leads to greater instability. As the American experience of growth during the past century demonstrates, comprehensive development is not possible without constant structural change. The growth of one sector leads inevitably to forces for change elsewhere, and this change either occurs in increments or is bottled up.

If the latter happens, change ultimately may be explosive, as it was in Russia in 1917 and in Cuba in 1959. Extreme violence can perhaps be avoided, however, if political leaders come to

view development and structural change as mutually sustaining and reinforcing.

Second, it is sometimes argued that development proceeds best in countries with strong, even authoritarian, government. There are, indeed, examples of economic successes in such countries, although, as suggested earlier, they may be achieved at the sacrifice of political development — even in the long run.

### Useful growth

Jean A. Mussard, in *La revue polytechnique*:

If, in losing our traditional instrument for measuring value we have lost the idea and even the very sense of value since we are no longer able to distinguish without an adequate criterion useful work from useless, fictitious or harmful work; and if we add up pell-mell all "work," whatever it may be, in our statistics, asking only whether it draws pecuniary compensation but not whether it is objectively justified — then what meaning do our unemployment and employment statistics have for us? How many "workers," without knowing it, are merely camouflaged unemployed, like soldiers in wartime? Should they be classified as such in a wiser analysis? And finally, what is the true significance of that GNP we use to measure "economic growth"?

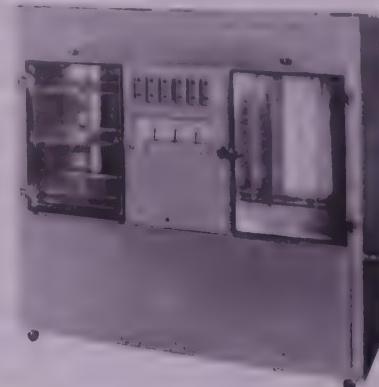
Furthermore, what will be the psychological and moral consequences of this evolution if it continues? This question does not concern the economists perhaps, but surely it concerns society. Growth? Yes, of course. But what growth? For what purpose?

If growth is diverted, even though only in part, to sterile ends — which indeed it is — it would be interesting all the same to know the value of the useful increase. "Armaments are increasing twice as fast in the developing countries as economic development," Olivier Revardin observed recently. Again we have very serious reasons to believe that this "economic development" itself is largely fictitious. Don't we need some instruments of economic analysis that will enable us to measure useful growth? Surely this does concern the economists.

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# COMMODITIES

## Imbalance in Europe's livestock sector

The pressure of world demand on the limited supplies of meat has recently reached a new intensity, with steep rises in world beef prices. In the developing exporting countries of Latin America "meatless" days or even "meatless" weeks have become common, while the scarcity in the richer importing countries has induced governments to relax their import rules so as to encourage the flow of supplies. But Europe has a unique difficulty: a livestock industry which simultaneously produces too little beef and too much milk. While the net deficit in beef amounts to over 500 000 tons a year and is steadily growing, there is overproduction of milk and surplus stocks of butter.

Europe, with its small farms, has to rely on the dairy herds as the main source of beef and veal. Yet action to curb the excess dairy output has the undesirable side effect of lowering beef output too. This problem is of widespread interest in view of Europe's position as a major import market, so the whole question has been examined in a recent FAO report<sup>1</sup> prepared with the help of a team of consultants.

The report makes a number of technical suggestions on ways of improving the choice of breed, of increasing the amount of beef produced per calf, and of raising the number of calves born. It also looks into other production techniques by which output of beef could be encouraged

without raising that of milk. The main economic conclusions are as follows:

Breeding programmes are basically governed by the comparative value of beef or milk. Experience shows that if the ratio of the price of beef (live weight) to milk is over 8:1, then it pays to choose a "beefy" type of dual-purpose breed. About 80 percent of the animals producing veal and beef in Europe come from dairy or dual-purpose (milk-meat) breeds, so that production is to a great extent dependent on the beefiness of these breeds. This is why the high-yielding Friesian breed has grown in numbers at the expense of lighter dairy and local breeds.

The fundamental question of increasing the number of cows in the national herd can be tackled through a new method — the bred-heifer system — by which unwanted heifers are mated to produce one calf before they and their calves are slaughtered for meat. But under present conditions, the value of the calf does not appear greater than the cost of feeding the heifer for an extra 6 months. This implies that a government subsidy would be necessary to make the bred-heifer system economically viable.

One of the key economic problems affecting Europe's livestock sector is that, except on large farms, the profits per hectare are too low to make specialized beef production — without milk sales — a viable alternative enterprise to joint milk and beef production. Specialized beef breeds, therefore, are only of significance in France, Ireland, Italy and the United Kingdom.

European farmers are actively trying to expand their production of beef through various technical measures. Yet technical improvements as regards choice of breed,

more intensive methods of production, and other possibilities must be supported by suitable economic policies. The shape of these measures needs to vary from region to region.

For Northwest Europe, various alternative policies seem more effective than the present price support system which generally depends on maintaining farm prices above those which would prevail under conditions of free world trade.

### **The best solution**

In the long run, a gradual shift toward a free market would offer the best solution in the livestock sector. Freeing market prices and supporting farm incomes directly would discourage milk surpluses, and also encourage beef production by making larger farms cheaper and more economic. To avoid hardship, temporary payments would need to be made to people who leave agriculture, with direct income supplements to those who stay, so as to compensate for the reduced price support. This system would benefit consumers through lower prices, provide selective support to farmers who most need it, and encourage trade expansion based on comparative advantage.

Such an important policy change would need to be combined with more effective programmes of structural reform, designed to accelerate the drift of labour from the land, to enlarge farms and to improve productivity. Larger and more efficient holdings would, in the medium run, encourage a switch from milk to more specialized beef production; in the long run, it is the best way of preventing too rapid a decline in the attractiveness of dairy farming in Europe.

For many reasons, such a

radical shift would no doubt be resisted. An alternative the report suggests, would be to make current policies more effective by selective changes in support prices. A relative decrease for cereal prices, a relative increase for beef, and no change (or slight increase) in the real price of milk would encourage adjustments in both supply and demand. Lower feedgrain prices would also favour the development of extensive beef production.

At present no major changes in current economic policies of the countries of Southern Europe are feasible because of the low productivity and large proportion of the population employed in agriculture. The main requirement is for development of marketing, processing and distribution facilities in line with the rapid growth in demand for both milk and meat. In the longer run, a gradual liberalization of beef imports would be desirable as domestic production is unlikely to keep pace with consumption in view of the adverse conditions for beef.

In Eastern Europe, a more effective implementation of the existing measures to raise production is required, rather than basic changes in policies. The crucial need is for more flexible policies and improved incentives at all stages of farming, processing and marketing. This should be accompanied by more centralization.

A further improvement in the profitability of cattle production, and particularly beef production, through price and investment policies should be encouraged in this region. A wider ratio of grain to livestock prices, including a broader milk-to-beef price ratio, is necessary. Priority should be given to raising the productivity of beef production by economic measures to discourage the slaughter

<sup>1</sup> "The Relationship Between Milk and Beef Production in Europe," FAO, June 1972 (AGA/MISC/72/10).

## COMMODITIES

of calves, and to raise the final weight of slaughter cattle. Changes in price ratios would release beef for export but at the same time call for an accelerated expansion of pig and poultry production. Such a policy would need flexible import policies, so as to ensure a sufficient supply of feedstuffs wherever domestic production is insufficient and prevent undue slaughtering in bad fodder years.

### **Demand hopeful**

It is clear that Europe will have a growing import demand for beef during the next decade and probably beyond, but the constraints on trade must be recognized. Cattle are of overwhelming importance to the majority of farmers, especially in Northwest Europe where import demand is greatest. Consequently it is highly likely that the governments of these countries will persist to some extent with protectionist policies. At the same time, these countries must safeguard their cattle industries from the disastrous consequences of importing epizootic diseases, and protect their consumers from the danger of food poisoning. All imports, therefore, are subject to strict health regulations, and at the moment the economic constraints take the form of tariff, variable levy and quantitative restrictions. Imports of chilled and frozen carcass beef are subject to licences granted only after the inspection and approval, by the importing countries, of the suppliers' slaughterhouse and beef handling facilities, and known absence of serious animal diseases. In the case of sterilized beef, the processing plants must be approved.

For developing countries supplying unprocessed carcass beef to Europe, in many instances it is important to

intensify efforts to eradicate animal diseases. But such investments are costly and will be realistically undertaken only if reasonable access to markets is granted. Beef production is a long-term process, and to ensure stability of supplies and prices in the interests of both importing and exporting countries a much closer international co-operation than has occurred in the past is needed.

The report suggests that those developing countries which are prevented by animal disease problems from entering European meat markets should consider carefully the growing market for

marily intended for the fresh market, manufacturing grade beef is not considered a threat to domestic prices. It is therefore likely to obtain a readier access to the European market.

Indeed, because of the shortage of this grade of beef, the EEC already permits considerable quantities to be imported free of levies.

### **Future trade patterns**

Governments acknowledge the need to reverse the trend toward agricultural protectionism. Within GATT, preparations have now started for a new round of inter-

too — when the present provisions lapse in 1977. Milk surpluses which arise in the enlarged EEC as a result of the acceleration of technical progress in the 1970s should as far as possible be channelled as food aid to developing countries. To make this a more orderly process without harming commercial trade, the feasibility of an international food aid convention for dairy products might be explored.

For beef, the prospective deficit is so large that Western Europe would benefit by giving the freest possible market access to all exporting countries, including those within Europe itself. The report suggests positive steps to remove nontariff impediments to trade, including those arising out of the incompatibility of veterinary practices and lack of uniformity in veterinary control procedures. The abolition of tariffs, levies and quantitative restrictions on imports of young cattle for fattening and calves should also be considered, although recognizing that there are several reasons why trade in meat is preferable to that in live animals. Tariff-free quotas on imports of slaughter cattle and fresh meat should be extended. The state import programmes of the socialist importing countries could usefully provide specifically for meat purchases from exporting developing countries, so as to give greater security of market outlet. Special assistance should be provided to promote the beef exporting industries in developing countries.

Finally, countries could explore together the possibility of arranging longer-term international trade agreements, especially on manufacturing beef, and on market sharing schemes which assure exporters an equitable share in the future growth of European markets.

E.S.C

### **Beef and veal in Europe 1970 and 1980**

	Production	Consumption	Import (+) or Export (-)
			Million tons
1970			
Western Europe	6.79	7.56	+ 0.77
Eastern Europe	2.06	1.82	- 0.24
Total	8.85	9.38	+ 0.53
1980 projections			
Western Europe	8.19	9.67	+ 1.48
Eastern Europe	2.70	2.48	- 0.22
Total	10.89	12.15	+ 1.26
1980 alternative forecasts			
Western Europe	8.43	9.67	+ 1.24
Eastern Europe	2.61	2.20	- 0.41
Total	11.04	11.87	+ 0.83

manufacturing grades of beef. Their cattle, being range fed and relatively slowly grown, are lean and of a type ideal for processing. If this beef is exported in sterilized form, either canned or cooked and frozen, the problem of animal diseases can be overcome. The processing plants would have to be approved by the governments of the importing countries. But since European-produced beef is pri-

national trade negotiations in 1973, with agriculture fully involved for the first time. What requirements are desirable for new trade policies in the European beef/milk sector?

For milk products, and especially butter, the future pattern of European commercial trade will be determined largely by the arrangements negotiated between the enlarged EEC and New Zealand — and possibly other exporters

**march 4-11 1973 porte de Versailles**

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# Easing the burden of debt — old and new

**loans without interest and aid without strings would reduce the 83 percent servicing costs**

by ANGELOS ANGELOPOULOS

In a previous article<sup>1</sup> we saw how so-called "development assistance" is forcing the poor countries to sustain a crushing debt load and creating a monetary situation which will become untenable within the next few years.

Indeed, out of the US\$17.2 thousand million total financial resources supplied to the developing countries by the DAC<sup>2</sup> nations in 1971, only \$7.68 thousand million, or 45 percent, can truly be called aid. The remaining amount constitutes nothing more than normal loans granted at market terms, often at high interest rates and generally amortizable on a middle-term basis. Moreover, these loans are "tied," which means that the borrowing nation is not free to buy the goods it needs in the most favourable world markets.

For this reason, we have proposed that the international organizations — particularly DAC — exclude private "contributions" from development assistance, and we welcome the World Bank's decision to make a distinction, beginning in 1972, between "official development assistance" and other monetary concessions. Thus, in its report for 1972, the World Bank defines official development assistance as the total of financial loans advanced by public organs to developing countries and multilateral institutions when they meet these conditions: (1) when capital grants are administered for the main purpose of promoting the economic development and well-being of the developing countries; (2) when such grants are conceded on favourable terms.

Although public aid to development does not constitute really free aid, we think that the World Bank's definition lies close to reality. This aid is equivalent to 0.35 percent of the industrialized countries' GNP. If we refer to the resolution passed by the United Nations General Assembly, which calls on each developed country to make every effort to effectuate "transfers of public resources" in an amount equal to 0.70 percent of its GNP,<sup>3</sup> we shall discover a gap of \$7.5 thousand million between the goal and reality. A concession of such a sum would contribute enormously to the Third World's economic and social progress.

The World Bank informs us that by January 1971 the developing countries' foreign public debt totalled \$66.7 thou-

sand million, or \$69.1 thousand million at the December 1971 dollar exchange rate.<sup>4</sup> (See Tables 1 and 2.)

The second table shows that private, State-guaranteed debts accounted for one fifth of the total foreign public debt; but if we add to the total the private debts contracted at market terms — which, according to some estimates, had risen to approximately \$42 thousand million<sup>5</sup> — we shall see that the external debt amounted to nearly \$112 thousand million, a staggering sum for the underdeveloped countries.

Each year these countries pay the lending countries huge sums in amortizations and interest for servicing their debts. In 1970 the cost of this servicing reached \$5.6 thousand million, which means that it absorbed 83.2 percent of public development aid which, during that same year, rose to \$6.87 thousand million. Out of the total grants (\$15 thousand million), servicing the public debt absorbed approximately 40 percent. But, adding the payments for "profits and interest" accruing from private investments, which amounted to \$7 thousand million, we see that the total charges for servicing the foreign debt represented 82 percent of the total financial grants for that year.

Thus, today more than four fifths of the new capital are absorbed in servicing old debts. This burden weighs heavily not only on the budgets of the debtor nations but also on their balance of payments. Meanwhile, the situation will worsen as time goes on. If the amount of new loans increases at the 1965-68 rhythm, by 1977 servicing the foreign debt alone will hit \$9.2 thousand million, against \$5.6 thousand million in 1970. Worse yet: according to World Bank projections, the cost of servicing the external public debt of 80 developing countries for the 1971-80 period — not counting the new loans — will soar to \$55.4 thousand million, an intolerable sum for these countries, threatened with serious crises which can only lead them into inevitable bankruptcy. Lightening the burden of debts already contracted is the first indispensable measure toward reorganizing the current monetary situation.

The conditions for such relief must be simple, uniform and generous, and they must be extended to include all public and State-guaranteed debts, including the loans conceded by such international organizations as the World Bank, the International Monetary Fund, IDA, etc.

As for private debts, it would be preferable if the parties concerned undertook direct negotiations to reach an acceptable agreement. This method of settlement is essential if each coun-

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try's reputation for solvency and confidence in international financing is to be maintained. But lightening the burden of these private debts remains no less indispensable.

It is important for a competent international organization to work out the terms. Hence, the various loans of each country should be consolidated into one or more new loans, according to the modalities we shall subsequently enumerate, but which can be summed up as follows:

- interest rate: two percent
- maturity: 40 years
- period of grace: 10 years.

Only on these conditions will the debtor nations be able to benefit from such an arrangement and establish the basis they need to relaunch their development programmes at an

Table 1

### Outstanding debt of developing countries in December 1970

Region	Million U.S. dollars		Percentage increase
	(December 1970 exchange rate)	(December 1971 exchange rate)	
Africa	10 693.5	11 230.7	5.0
Asia and the Pacific	23 936.9	25 029.4	4.6
Southern Europe	6 963.2	7 252.7	4.2
Middle East	5 732.8	5 890.7	2.8
Western Hemisphere	19 372.1	19 699.5	1.7
<b>Total</b>	<b>66 698.5</b>	<b>69 103.0</b>	<b>3.6</b>

Table 2

### 80 developing countries: external public debt outstanding, including undisbursed, in December 1970

Type of creditor	Amount		%
	Million U.S. dollars		
Bilateral official	32 247.5		51.3
Multilateral	13 628.2		20.4
Private suppliers	8 392.4		12.6
Private banks	4 904.2		7.4
Other	5 526.2		8.3
<b>Total</b>	<b>66 698.5</b>		<b>100.0</b>

Source: IBRD.

accelerated pace. Otherwise, new short-term systemizations would be necessary, as often has been the case in certain Latin American countries.

Logically, such an arrangement can only evoke favourable reactions. It satisfies both parties concerned. It allows the debtor nations to benefit from a sizable supplementary aid, which is a *sine qua non* condition if the crisis threatening them is to be averted.

On the other hand, by aiding the debtors, the creditor nations are assured that the capital advanced will be fully reimbursed. We must not forget, moreover, that the underdeveloped countries' excessive deficits are largely imputable to the rich countries which, especially in the case of export credits, have often demanded higher prices — indeed, much higher — than those prevailing on the world market.

This proposed consolidation, aiming at reducing the initial interests and prolonging the period of payment, is similar to financing practice frequently adopted by the industrialized countries. For example, the United States granted the United Kingdom a loan of \$3 750 million to fall due in 50 years (1950-2000) at a two percent interest; the agreement even included a clause stipulating that, under certain circumstances, the interest could be cancelled.

Why shouldn't a practice deemed legitimate for certain industrialized countries be equally legitimate for other countries where the populations are hard put to appease their hunger?

The first consequence of such a relief programme would be to ease the budgets of the Third World countries and supply them \$55 thousand million in foreign exchange, i.e., the cost of servicing the old public debt.

The burden would be still further alleviated if the programme also included private loans — which impose conditions even more unfavourable — estimated at about \$10 thousand million on 1 January 1971.

But it is not enough simply to correct the prevailing situation; favourable conditions must be provided for future financing. These two procedures — easing old debts and new financing — are so closely allied that neither can attain its objective without simultaneous application of the other.

The new system we propose should incorporate these positions:

- total loans of \$100 thousand million should be granted over a ten-year period, with \$40 thousand million conceded during the first five years;
- two thirds of these loans should be made without interest to the poorest countries, and one third to countries with medium incomes at a two percent interest rate;
- all these loans should be redeemable in 40 years, with a ten-year period of grace;
- the "tied-aid" system should be abolished and replaced by contributions from each industrialized country, to be turned over to an international institution;
- financial administration and management should be entrusted to the World Bank, which would properly reorganize its activities in this sector to become the exclusive instrument for development operations;
- when the ten-year period of grace expires, the new financing would follow the model customarily used by the developing countries. Once the countries concerned have surmounted the obstacles to their development and set out on the road to expansion, they would no longer require aid on favourable terms.

### Where to look

Nevertheless, the problem still remains of finding funds indispensable to financing, both to assure the necessary capital and to cover expenses, bearing in mind that the loans would be advanced without interest in the majority of cases.

Two approaches — one positive, the other negative — would assure the Third World countries of financing in the amount of \$140 to \$165 thousand million for the entire decade or approximately \$15 thousand million per year. Utilized in well-prepared and well-executed projects during the ten years, such financing would enable these countries to achieve a high rate of growth and effective progress in every domain.

Assuming that, of the total financing, the burden of the old public debt would be relieved by \$40 thousand million, still a sum of \$100 thousand million remains to be found for the debt — in other words, \$10 thousand million annually — to assure the positive phase of the financing.

In our view, this problem in itself presents no great difficulties. Here we shall point out two possible sources, one principal, the other complementary.

If the United Nations often-repeated resolutions — according to which "the industrial countries should dedicate one percent of their GNP for aid to the developing countries" — were actually honoured, this would create a financing flow of roughly \$17 thousand million. We know that the GNP increases on an average of five percent annually in the rich countries. To make the proposed financing project possible, only 0.5 percent of the GNP, or less than half the percentage asked for by the international organizations, would be adequate *providing this contribution were given gratis*. It would constitute the main source of financing.

Such a policy followed by the rich countries should meet with no opposition since today's contribution amounts to 37 percent of the GNP, while several years ago aid in the form of "gifts" amounted to 0.5 percent. If that aid has not produced the results anticipated, this is because of defects in the "tied aid" system, irrational administration of aid, the lack of a single organ responsible for managing aid and, primarily, the highly unfavourable conditions involving her loans to the poor countries. On the other hand, experience has proved that gifts granted directly by the donor countries to the receiving countries have not only fostered political pressures but also encouraged waste, mismanagement and misappropriation of funds. Such gifts generally are likely to create a climate of irresponsibility in their utilization, whereas loans allocated by the international organs under certain specific conditions oblige the borrowing countries to manage them with due efficiency, since these loans must eventually be repaid.

For the developing countries, the essential need is not only to increase the volume of financial support but also to administer and utilize it with greater efficiency. These countries would gladly agree to reimburse the borrowed capital on a long-term basis providing they were spared the high rate of interest, which burdens them with crushing debts and inevitably renders them incapable of fulfilling their obligations.

As for the complementary source of financing we have mentioned, here is the principle. Should the price of gold be officially revalued — which is inevitable — the total benefits of the resulting plus value should not, for economic, social and moral reasons,<sup>1</sup> be monopolized by the central banks holding the gold reserves. The price of gold has been stable for more than 35 years because of international agreements; this has enabled the central banks to buy the metal at a price lower than it would have cost if the market conditions had been the same

as those of other commodities, which have more than doubled in price. Therefore, the total plus value, which today would result from an international agreement normalizing the official quotation of gold, should in no case accrue exclusively to the issuing banks; it is a patrimony belonging to all humanity.

A revaluation enriching only the industrialized countries by \$30 thousand million would moreover provoke a violent shock to public opinion, particularly in the Third World.

Hence, an equitable sharing of this plus value would be the basic premise for an acceptable revaluation. At least one third of the profit should be reserved for financing the poorest countries through a special fund set up by the World Bank.

This appropriation would be equivalent to a profit tax supporting the principle of international solidarity, for the benefit of the most deprived nations. It would be fully justified.

In all the developed countries, profits accruing from an "automatic" growth in the value of certain elements in a phase of exceptional prosperity — for example, the plus value of

property resulting from a strong demand for housing, from works executed by public services and from the sale of private enterprises (goodwill, etc.) — are heavily taxed by the State because the profits come from events of an economic and social character and cannot be attributed to the industriousness of the owner of this "element of good fortune." Shouldn't the same thing be true in the case of the plus value deriving from a readjustment in the price of gold? There is no doubt of it, but in this case, the reserves would be held by the States, which would collect a direct profit as a result of an international agreement involving the entire globe.

What international organization, then, would be entitled to appropriate a part of this profit?

The United Nations, being a supranational organ, could solve the problem. The developing countries should ask the UN to adopt a resolution providing that, in the event of any official revaluation of gold, whenever it should occur, one third of the plus value be automatically transferred to the World Bank and appropriated to finance the Third World countries.

It is evident that this method of distribution would benefit the industrialized countries as well. The share of the plus value allocated to help the poor countries would indeed be used promptly to buy equipment and consumer goods, thus stimulating the developed nations' exports. In short, it would amount to a new Marshall Plan. ■

<sup>1</sup> See CERES No. 24 (November-December 1971), page 45.

<sup>2</sup> Development Assistance Committee of the OECD.

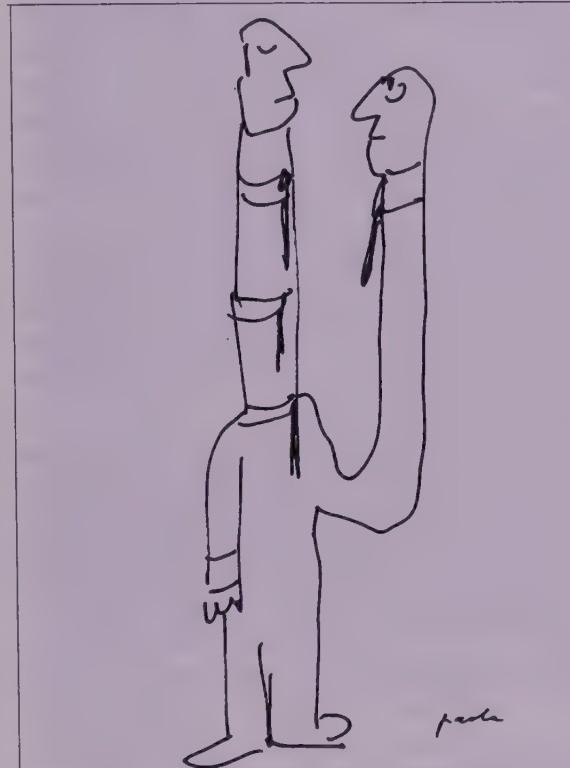
<sup>3</sup> United Nations: Towards an Accelerated Development for the Second Decade, New York, 1970 (paragraph 42 of the Resolution).

<sup>4</sup> All the figures cited, except where otherwise indicated, have been taken from the World Bank's Annual Report 1972, New York, 1972.

<sup>5</sup> This estimate is based on a document issued by UNCTAD (TB/B/C.

3.73, February 1970).

<sup>6</sup> See our studies Gold in the Service of the Developing Countries, Geneva, 1970 (Nagel) and, more recently, Le tiers monde face aux pays riches (Praeger Publishers), p. 147-165.



Providing they are spared the high rate of interest . . .

# The decolonization of agriculture

**above all it meant the overturn of agrarian structures and social relationships**

*"The Agrarian Revolution must enable us to liquidate the after-effects of a system of colonial agriculture which allotted the best soil for export crops, did no intensive stock breeding and relegated food crop farming to marginal land."*

Charter of the Agrarian Revolution

In a famous letter to Marshal MacMahon, Napoleon III outlined the development prospects for French-colonized Algeria in these terms:

"...Africa's land is so vast and its resources to be developed are so abundant that each man can find room there and give free rein to his pursuits according to his nature, his principles and his needs: for the natives, breeding horses and livestock and the natural cultivation of the soil; for European enterprise and intelligence, exploiting the forests and mines, draining, irrigating, introducing improved crops and importing those industries which always precede progress in agriculture and go hand-in-hand with it..."

Today we recognize this vision of the future as uncannily penetrating, except for the fact that French colonialism, less idealistic than the Emperor and his counsellors, influenced by Saint-Simon's economic theories, gave its own interpretation as to how "each man" could find room in Algeria and "give rein to his pursuits."

Indeed, within a few decades, nearly

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twenty thousand colonial farms were operating on more than two and a half million hectares, or one third of the country's total cultivable land. By 1957, their combined gross revenue amounted to 165 thousand million old francs,<sup>1</sup> or 60 percent of all Algerian agriculture's gross revenue; also they contributed more than half the country's exports.

Moreover, the colonial sector had built up an imposing infrastructure to facilitate their work, as well as a whole gamut of industries and supplementary trade circuits.

Meanwhile, the Algerians had to content themselves with what remained: some five million hectares of arid or hilly terrain, too sterile for profitable development and inhabited by over 630 000 peasants.<sup>2</sup>

After a long and bloody war of national liberation occurring one century after Napoleon's imperial dispatch, what was the balance sheet of that agricultural system taken over by the Algerian Government? And how could such a system help to resolve the many difficult problems posed by the demands of the nation's economic and social development?

## Transition

When, beginning in October 1963, all the farms previously occupied by the colonists were nationalized, the Algerian State became the owner of the country's most fertile soil, of a large development infrastructure and considerable means of production. Besides, the availability on the land of a proletariat trained for several decades to work in teams and using mechanical methods of production could only facilitate the transition to a

collective management system, indispensable to ensure the operation of the farm since almost all foreign technical personnel had disappeared.

It turned out, however, that this hodge-podge of immense means and possibilities was fraught with onerous burdens in form of imbalances and structural distortions resulting from the specific characteristics of the system followed by French colonials in Algeria. We schematically point out three different closely related negative factors with which the Algerian Government has had to struggle.

Firstly, the techniques adopted in colonial farming, particularly those used in grain monoculture, were widely practiced and highly mechanized. Based on principles of dry farming and cultivation of fallow land, virtually excluding any method of restoring the humus, in those areas where the vegetative covering was very delicate — the high Tiaret plateaus and the Constantine plains — these techniques resulted in stagnation and a decline in soil fertility, and brought on the ravages of a naturally virulent erosion. In other areas — viticulture, arboriculture and market gardening — the almost total lack of stock breeding, hence lack of organic manure, induced similar results.

Secondly, the high rate of mechanization plus the very extensive nature of the colonial farming programme had considerably reduced the number of jobs in the colonial sector, except in those areas given to viticulture, arboriculture and market gardening. In the entire growing highlands, an average of 100 hectares was worked by a single labourer.

Thus, nearly 90 percent of the population's available labour force

**by MARC OLLIVIER**

barred from any possible participation in productive work on land accounting for more than half of the nation's agricultural potential.

Thirdly, the very structure of production of colonial agriculture was woefully unbalanced; wholly destined for the market and consequently speculative by nature, it was dominated by a policy of subsidies and protective barriers in what amounted to an extension of French agricultural policy. Its vineyards alone supplied more than half the sector's output, followed by vegetables, fruits and grains. Except for tobacco, the colonists grew no industrial crops (sugar, fats) and there was no intensive stock breeding (see Table 1).

#### **Deep damage**

It is futile to dwell on the baleful technical consequences of such a production structure; suffice to say that the absence of stock breeding and industrial farming seriously harmed crop rotation, prevented the maintenance of a satisfactory humic balance and therefore contributed to the deterioration of the soil.

But the damage wreaked by this imbalance was still something else. For one thing, it made Algeria wholly dependent on foreign exchange, especially on the French market, both to sell the major part of her agricultural output and to import those foods she did not produce. Secondly, it exacerbated the food shortages suffered by the local rural population, who were usually self-sustaining.

Unfortunately, no accurate studies exist on the diet of Algeria's different population categories. In 1969 global estimates were attempted to measure the average availability of food per inhabitant,



ALGERIAN TREE NURSERY AMONG THE RUINS OF IMPERIAL ROMI  
Immense resources burdened by history

including imports, during the 1963-67 period.<sup>3</sup> Comparing the figures with similar data furnished by FAO for Italy in 1964-65, for example, one can gauge the gravity of Algeria's food problem, both quantitatively and qualitatively (see Table 2). These global figures merely show that the problem existed; in reality the majority of the people, particularly the rural dwellers, were suffering from a worse nutritional deficiency than the table's averages suggest.

If we compare the average per caput consumption with Algeria's agricultural output, after deducting her exports, we see that her production could supply only a daily average of 1 280 calories per inhabitant, or barely 60 percent of an already inadequate consumption level. The remaining supplies had to come from imports, which included virtually the population's entire sugar consumption, one third of its consumption of dairy products and four fifths of its fats.

### Bitter wine

This situation was all the more disturbing in that, except for fruits and vegetables, Algeria's agriculture had been stagnating since 1930, while the population was rising sharply. Furthermore, Algerian agriculture's dependency on France, especially as a market for its wines, was hard to bear after 1952, when France promptly slashed the prices she had been paying the colonists for wine, and eventually reduced her purchases until she eliminated them almost entirely.

These factors of dependency on the former colonial metropolis weighed heavily on Algeria just when the Government's priority goals policy aimed at freeing the nation's economy from the domination of foreign capital in every sector — first in finance, then in mining and industry and finally and especially, in petroleum production, transportation and processing. The demands imposed by this policy of economic liberation plus the necessity of confronting the population's food needs and of reabsorbing the imbalances resulting from colonial exploitation compelled independent Algeria to restructure radically its colonial agricultural system.

These are the main reasons why — after a period of organizing and consolidating its means of action, notably its cadres and technicians — the Algerian

Government embarked on a global policy of agricultural reconversion and development within the framework of the 1970-73 four-year plan.

The guidelines of this policy aim, in principle, to reabsorb the imbalances and distortions, inherited from the colonial period, and to assign to agriculture a strategic role in the process of economic development and social progress, which is now affecting the whole of Algeria.

### Global character

The essential feature of this new agricultural policy is its global character. It is no longer a question of listing unrelated operations and objectives, regrouped merely to make an administrative presentation but, on the contrary, to strive to restore equilibrium and an overall consistency in man's interventions on the natural environment, in order to satisfy the population's requirements as far as possible by reconstituting the biological potentiality of the country's soil, flora and fauna, both natural and selected species.

Within the limitations of this article, we cannot describe in detail all the various aspects of this new agricultural policy;<sup>4</sup> rather, we shall point out the most important elements comprising the key objectives around which its multi-faceted global interventions revolve.

First, the reconversion of the vineyards — in other words, the programmed uprooting of vast vine-planted areas and the restructuring of the remaining vineyards. The economic and social place of the vine was so important in Algeria's colonial agriculture that President Boumedienne himself launched the programme of extirpation, justified mainly by the need to break off all bonds of economic dependency, which were hampering the Government's work. From the 355 000 hectares they occupied in 1962, Algeria's vineyards must be progressively whittled down to 200 000 hectares.

By priority, all over-age plants will be uprooted (more than 30 percent of the vines were at least 25 years old in 1925) as well as the vines planted on irrigable or well-watered soil. The areas thus cleared are either being reverted, according to each case, to annual crops such as market produce, industrial crops, fodder and high-yield grains, or else reserved for arboriculture. The remaining vineyards will be converted to increase the output

of table grapes, with cultivation expanding from 6 000 to 8 000 hectares, raisin and, primarily, high-quality grapevine to valorize wine production. This programme is already realized in part; in 1972, Algeria's vineyards had been reduced to 238 500 hectares.<sup>5</sup>

Next came the socialist sector's efforts to intensify stock breeding and set up projects to organize and equip animal farms.

Stock breeding was practically nonexistent in colonial agriculture. It was a serious flaw, and since 1963 herds of high yield milk cows have been assembled conformity with a programme to import 12 000 heifers annually. This initial programme figures prominently in the four-year plan, which is seeking to achieve these aims:

- to set up a whole infrastructure for reproducing and improving breeds: seven improvement stations, two farms, schools and a national centre of semi-production to supply the existing centre of artificial insemination;
- to promote a primary phase of infrastructure for animal health; veterinary centres and dispensaries will be established in all zones where intensive stock breeding is being developed;
- to build an integrated infrastructure for collecting, processing and marketing milk, and to realize a considerable expansion in the livestock feed industry;
- to establish modern slaughterhouses throughout the country and procure 28 000 m<sup>3</sup> of refrigerator equipment;
- to construct 2 500 000 m<sup>3</sup> of hangars and 250 000 m<sup>3</sup> of silos for storing food.

### Reconversion

The sum total of these investments will also benefit the increase in intensive sheep breeding in the socialist sector. In equipment for the pastoral sector, the latter, almost completely neglected in the past, must also undergo extensive transformation before it can be integrated into the nation's development. 500 000 hectares of terrain will be prepared by digging 750 wells and building thousands of sheepfolds and sheep pens. Thirty sheep trains will be readied and 10 reproduction centres built.

The development of stock breeding in Algeria clearly involves other domains, particularly aviculture, which must be rapidly extended; but the main n

viously to create and expand intensive vine and ovine breeding, not only because this will enable Algeria to fill a serious deficiency in the nation's diet but also because it holds a strategic position, in virtue of its close bonds with crop rotation, in the vast programme of reconversion and re-equilibrating development systems launched by the four-year plan. This programme of crop reconversion is the third strategic factor marking Algeria's new agricultural policy. It embraces a whole gamut of innovations designed for many different sectors: in industrial farming over vast areas, the production of sugar beets, sunflowers, more market gardening and crops intended for canning, etc; arboriculture; the renewal and expansion of olive groves, citrus orchards and various fruit trees; and the expansion of forage crops, a dominant factor in crop rotation in connexion with the development of intensive stock breeding.

One of the major goals of this recon-

version project is to join re-equilibration together with intensified crop rotation in such a way as to arrest biological deterioration of the soil and to phase out the disastrous practice of abandoning fallow land. Out of six million hectares devoted to grain crops, over two and a half million have thus far been rendered sterile by this widely used method, which induces the ravages of soil erosion caused both by wind and run-off water. The first stage of the four-year plan calls for total elimination of fallow land in sufficiently irrigated zones where complex crop rotation planting is possible, including industrial crops, market gardening for preserves and forage plants next to grains. Meanwhile, fallow land is being reduced in the more arid zones through the introduction of a crop rotation system combining leguminous plants and forage plants with grains. Thus, the Algerian agronomists hope that, with the aid of other crop improvements (fertilizers, wind-screen planting, protective forest curtains

and control of run-off water) and the organic restitutions making the development of intensive stock breeding possible, the present expanses of fallow land will be sharply reduced and the enormous losses they entail considerably limited.

Lastly, a fourth fundamental line of action in agricultural policy is being applied: a programme to defend and reclaim the soil by reforesting, retimbering and terracing those areas badly hit by erosion. The problem of reclaiming the soil and controlling run-off water is particularly serious in Algeria, as we have pointed out. The reforestation rate is one of the lowest in the Mediterranean basin and very erratically applied throughout the country. It would be the most useful on the highlands and slopes of the Tell's inner basins, where the forests have suffered the worst degradations, covering barely three percent of the land. In 1967, Algeria's wooded surface extended over only 2 400 000 hectares, of which 1 800 000 hectares were overgrown with brushwood and scrub (in 1830, the expanse was estimated at four million hectares, while the areas subject to the climatic influence of the forests totalled over seven million hectares, according to the specialists).

### **Reforestation policy**

The long-range objective is to rehabilitate a minimal forest area of four million hectares; indeed the four-year plan calls for reforestation at an annual rhythm of 50 000 to 100 000 hectares, to be stepped up in the subsequent years. Meanwhile, more than 300 000 hectares of forest have been planted and improved, and operations to defend the soil have been undertaken on 100 000 hectares.

We particularly stress the decisive role of this dynamic forestry policy because it affects the whole range of Algeria's agricultural development objectives: defence of the steppe and organization of sheep breeding, protection against damage from the wind and run-off water in the cultivated zones, protection of slopes against erosion, anti-silt barriers, etc.

In our view, these strategic measures constitute the nucleus around which the scope of the new Algerian agricultural policy is articulated. To explain it more fully, we should have to mention many other areas of intervention, where ambitious programmes are also being carried

ole 1

### **Algerian agricultural production in 1955**

(all sectors)

Grains	46	Stable since 1930
Vines	87	Stable since 1930
Fruits and vegetables	33	Doubled since 1930
Animal products	43*	Stable since 1930
Other	26	Stable since 1930
Total	235	Almost stagnant since 1930 when the population growth rate began to increase

in thousand million old francs

\*Produced almost entirely by the noncolonial sector.

Source: S. Amin, *L'économie du Maghreb*, Paris 1966, p. 41.

ole 2

### **Average consumption per person in daily calories**

	Algeria 1963-67 (IREP* estimates)	Italy 1964-65 (FAO statistics, 1965)
Grains	1 405	1 191.2
Starches	56	97.3
Sugar	220	268.6
Legumes	31	85.8
Vegetables	35	
Fruit	83	143.8
Meat	43	
Eggs	8	38.3
Bread	6	10.3
Milk, milk products (excluding butter)	81	87.5
Fats	213	455.3
Total	2 181	2 570

out to achieve that global consistency for which the Government is striving: to renew and increase equipment and the infrastructures essential for its maintenance; to accelerate and expand the use of selected seeds; a massive expansion of nurseries, both for forestry and arboriculture; the construction of dams and the extension of irrigated zones; and finally the training of cadres on all levels, made at a considerable effort, to furnish this immense reconversion and development undertaking with technicians and specialists indispensable to its success. It all fits together naturally; we believe, however that the motivating orientations which constitute the framework of the overall policy are those we have summarily outlined.

### **Living elements**

It goes without saying that implementing such a far-flung project cannot be done without encountering a great number of difficulties of every kind. Certain problems are common to all sectors of economic and social development, such as the dearth of technical personnel and the inadequate skills of the workers, whereas other problems are unique to agriculture. Developing Algerian agriculture does not mean creating a whole new branch of national economic endeavour from scratch, as with industry, but for the most part reconverts an existing productive apparatus, correcting its shortcomings and increasing its potential capacities. This productive apparatus is composed of soil, plants, trees and animals, i.e., living elements whose transformation must follow immutable biological rhythms. But above all, it means to overturn agrarian structures and social relationships, tied to the rules laid down by colonial agriculture, which raise insuperable barriers to a rapid, efficient realization of the Government's policy.

To be sure, these barriers began to totter when the foreign colonists ceased bagging the most fertile land. But there is still a small layer of powerful national landowners opposed to any modification of the status quo. Moreover, the remaining private sector is divided among a multitude of small and middle landowners who, taken singly, are in no position to introduce into their limited holdings those transformations necessary to reconvert and develop their potential assets.

Finally — and most crucially — massive unemployment and underemployment among the rural labourers continue to plague all Algeria. Those affected include the landless peasants, seasonal labourers and small farmers lacking work equipment. To the nation, they represent at once a source of destitution and an extravagant waste of resources.

These observations, which apply also to all those countries grappling with the problem of attaining rapid progress in food production and global agricultural productivity, have spurred the Algerian Government to sponsor a radical transformation of its agrarian structures and social relations in agriculture to answer the needs of the country's most dispossessed rural population. In its desire for coherency and efficiency in its undertakings, the Government must closely bind the implementation of its reconversion and production development objectives with a transformation of the agrarian structures, with a mobilization of all available labour forces and with social progress in terms of an "agrarian revolution" affecting all aspects of life in the rural world.

### **Two principles**

This "integrated" concept of the Government's new agricultural policy is clearly explained in the following passage from the Agrarian Revolution Charter:

"Two principles can be considered fundamental, according to the viewpoint from which the agrarian revolution is seen. On the political level, the application of the principle that the land should belong to those who work it. This leads to the suppression of absentee ownership and the limitation of proprietorship, which could seem sufficient toward achieving social justice. On the economic level, the formation of cooperatives and development of the land's agricultural potentialities could appear to be an appropriate solution to the problem of development."

"But in reality, these two approaches cannot suffice in themselves because a total, concrete realization of social justice cannot be achieved only through a simple land reform. Economic measures, by their impact on the peasants' living standards and labour, are indispensable to guarantee them their share of the fruits of development, thanks to the agrarian

revolution. Conversely, the only economic actions not inserted in a political prospect which assures their consolidation and gives them a human finality would make of the agrarian revolution an operation to be indefinitely renewed.

Certainly, the history of upheavals encountered by Algeria's agricultural policy strikes us as a clear illustration of the truism, too often ignored or disguised behind technocratic quibbling: *the technical conditions of any development project or agricultural intensification are tightly bound to the interests of the socio-economic forces which orient and guide such development.* If Napoleon III, in the nineteenth century, could foresee so accurately the principal forces which gave rise to the development of colonial agriculture, it was because the interests of the French economic and social system had extended their ascendancy over the whole of Algeria.

Subsequently, the colonial agricultural system's imbalances and internal contradictions were analysed and denounced by various clear-thinking, courageous agro-economists, economists and sociologists.

But in the national interest, the Algerian people, directly injured by these contradictions, were obliged to reimpose their sovereignty over the conduct of the country's public affairs in order to abolish the operational rules of the colonial system.

Today at last, in order to sweep away the social and regional disparities which disrupt agricultural development and the distribution of the diverse productive activities throughout the national territory, the Government has taken strong action to mobilize and organize the nation's most deprived rural population within the framework of a radical agrarian revolution because they are indeed the socio-economic forces mainly affected by the implementation of such agricultural policy.

<sup>1</sup> 1.65 thousand million new French francs.

<sup>2</sup> Figures taken from the Tableaux de l'économie algérienne en 1960.

<sup>3</sup> See the works of René Arrus in the study report mimeographed by the Institut de recherche économique et de planification (IREP) in Grenoble, Algiers, Ministry of Industry and Mines, 1969.

<sup>4</sup> We refer readers who would like more details to the Algerian Government's official publications, especially: Rapport général du Plan quadriennal 1970-73; Le développement de l'agriculture, Ministry of Information, Algiers, 1971; and Tableaux de l'économie algérienne 1970 (supplement to the four-year plan).

<sup>5</sup> Algérie Actualités, No. 364, October 8, 1970.

**ceres**

In your writings and public statements the population problem is given paramount importance in connexion with the development process. Why is this the major problem for the developing countries in the 1970s and beyond?

# Michanek: it is very shortsighted to say that population control is an invention of the rich

**Michanek:** It is not necessary to say that development is for human beings and that the number of human beings is therefore at the root of the problem. Now that these numbers have grown larger than ever, it seems to me that we have to start thinking of mankind in terms of a certain number of human beings. It has become clear that we are destroying our environment, that we are beginning to deplete our resources. Why? Because we are too many. Although conditions vary widely in different countries, those who cause most of the pollution — while rather few relative to the total population of the globe — enjoy standards of living that are too high for their environment to be preserved, and not only their environment but also that of the earth as a whole.

The world can no longer be looked upon as a number of separate parts, countries or continents or whatever division you make, and likewise it is increasingly apparent that we cannot accept the use of the world's resources for the benefit of a few. We must consider what implications resource use has for the planet as a whole, for the population of the world in its entirety. Let us recall the words of the late Lester Pearson when he said: "a planet cannot, any more than a country, survive half-slave, half-free, half-engulfed in misery, half-careening along towards the supposed joys of almost unlimited consumption." Neither our environment nor our moral precepts can accept such a condition in the long run. Problems of poverty, pollution, population are very closely intermingled — this is what I call the PPP approach: they must be thought of as a kind of tripod, linked together in such a way that you must study the problems and the strategies and the solutions on the basis of an integrated approach.

**ceres**

Probably the only body in a position to tackle the problem on a planetary scale is the United Nations. Do

you feel that some steps have been taken in elaborating this comprehensive strategy which you favour?

**Michanek:** Yes, indeed. To be sure, the strategy finally adopted in the field of population for the UN Second Development Decade was very unsatisfactory as far as population is concerned. But it is significant that they calculated that population growth rates over the 1970s would not exceed 2.5 percent annually as a general average in the developing countries, and it was made clear by those who drafted the strategy that this implied a lowering of the birth rate, since all earlier calculations pointed to a higher rate. Thus without going so far as to say so explicitly, the strategists took a position that something must be done about birth rates. But as for what targets we should aim at in various countries or regions, these, as well as policy guidelines, were not elaborated. For the time being one has to base oneself on decisions by individual nations, and of course by the individual family. It is therefore all the more necessary that the world community assist all countries in developing a sound population policy. This means creating awareness of the problem and a bank of knowledge on how to deal with it. This is something that the UN can do and is now about to do. The Economic and Social Council and its Population Commission have recently taken a number of positive decisions and positions. The decisions on a World Population Year and a World Population Conference in 1974 constituted a first very important step. The Population Commission is now working on what it calls the world population plan of action. Expert groups in the UN Secretariat have produced interesting papers during the last year and this is to lead to a number of preparatory regional and national meetings and seminars on particular aspects of the problem of population and development, population and environment, and population and human rights. I feel that all these meetings in the next two years will educate not only specialists but that more and more politicians will come to understand what population increase means to development, what has to be done and what can be done, to slow the rate of increase.

**ceres**

Very often population pro-

grammes are thought of as family planning, and nothing else. How would you define the essence of a population policy?

**Michanek:** Why not start with the family? A human being has the right to the knowledge and means to exercise his right to prevent unwanted births. This was recognized by the UN in a proclamation at Tehran in 1968. First, then, comes the knowledge. Second are economic, social and health considerations: child care, for example; a decent life for the offspring, which includes ending the terrible situation which has plagued mankind for so long, in which a great number of children — and grown-ups, for that matter — die prematurely. I think that you can never demand of two human beings that they space their children, or that they cease giving birth to children, as long as they cannot feel secure that a certain number of offspring will have a reasonable chance to remain alive. So I see it as an extremely important part of any population policy that you develop a health programme. This involves better nutrition, medical treatment, sanitation, slum clearance, education, and the whole range of social, economic and cultural development. What I am speaking of, however, is not simply a general social welfare policy, but one which aims at keeping the numbers of the newly born at a reasonable level.

**ceres**

To what extent are different policies conducive to lowering birth rates?

**Michanek:** First of all, experience shows that all people want to keep the number of their offspring within reason. If you provide the knowledge and means and if you can preserve the life of the children already born, the rates will go down. This is why I feel that the main goal of a national population policy should be that all children should be welcome children. Wanted by their parents because the means which will secure the life of the child and the basic welfare of the family exist. Thus as a part of our population policy in Sweden, we have thought not only of education in sexual behaviour and means of contraception — in fact we have never had any large Government programme of this kind in this country — but of the health services

for the mother-to-be, irrespective of her marital status, and the protection of the child before its birth, and immediately afterwards, over the next few years. To this there were added certain social welfare steps guaranteeing the economic and educational base for the family.

**ceres**

In many parts of the developing world there is strong opposition to investing in population programmes. Considerable numbers of people do not accept the problem as you have presented it. They argue that underdevelopment, and particularly unemployment, are far more serious dilemmas, and that money spent on population programme is an inefficient way of dealing with the larger issues.

**Michanek:** I accept the thesis that solving the population problem will not be a solution to the problem of development, but look at it the other way round you will never be able to solve the problem of development if you do not solve the problem of population. They go together, and the question is whether there are any ways to influence development by population planning, or whether you just have to sit and wait until people find the answers by themselves, have the economic basis for another behaviour.

Furthermore, I must oppose the thinking, if it exists, that the funds which have gone into family planning operations are big. They are not. They are deplorably small: at present no more than US\$20 million a year. This means that only a mere fraction of the thousands of millions of dollars which annually go for development assistance is being used for population programmes. You can make all kinds of comparisons and you will see that the figures are very small and that if these meagre funds had been used for creating jobs through, for instance industrial build-up, that would have had no impact at all.

**ceres**

But do the results of population programmes, which are said to be very poor, justify even this expenditure?

**Michanek:** I think that it is an exaggeration to say that the results are poor. We do not know for sure exactly what causes what, but there is evidence to show that these programmes have been wor-

ile, both from the point of view of search and individual human happiness, far as family planning has been put the disposal of the people who want

The problem, however, is to make people want it — and to make it available, and here one answer is research. Sweden, for example, has been among those who took the initiative and advanced the build-up of a research programme under the World Health Organization. We hope other countries will come along and join in a really worldwide research programme into the reproductive process of the human being, giving rise to the knowledge that will produce the ideal contraceptives. At the present time we do not have them. You know we have the pill, we have condoms, the IUDs (intrauterine devices)

correctly describe it, it is a global, social human problem.

**Michanek:** Of course, the problem is global, one as much of the developed countries as the developing. The United States, for example, recognizes this, which is why it established the Rockefeller Commission on Population Growth and the American Future. Other rich countries as well have a similar problem and are doing something about it, the United Kingdom, for instance. In this connexion, it is interesting to note that the Rockefeller Commission, in its recent report, recommended that a policy be followed which would eventually lead to zero population growth in the U.S. by means of voluntary acts of individuals. One reason is that the Commis-

going to double, within, say, 30 years. Now, where is most of this increase going to take place? Unquestionably in the less developed countries. Can they cope with their economic problems over the next 30 years? Can they create the jobs, the educational facilities, the housing and the sanitation arrangements for these enormously increasing numbers? Can they provide the food? I think that they will find that what is likely is only a further widening of the gap between the more and the less developed countries, as well as within each of these countries themselves. It is thus very shortsighted to say that this is an invention of the rich.

**ceres** What are Sweden's priorities with regard to the global population issue?

**Michanek:** Although we have reached zero population growth or are very close to it, we have no concrete answers to the problem to offer to others. Our own low growth rate has come about as a kind of a natural process of development, not because of any particular will of the Government. So we cannot tell the world about our own experience, but we can help other countries find their own solution. We of course are a comparatively small participant in the worldwide development partnership, but we want to increase our efforts in international cooperation, first of all, if possible, through the multilateral programmes of the UN family (financed a great deal by the United Nations Fund for Population Activities) and through bilateral and non-UN international activities. The UN was slow in coming along in the field of population. The Swedes and Norwegians started more than 20 years ago making recommendations to various organizations of the UN in this respect. It took some 15 of those years to get some meaningful support. Now the UN organizations have begun to move — but they are still not moving fast enough with regard to the population problem; their efficiency is low and their experience in this field is inadequate. For the present, we have to rely heavily on the expertise of others, and not least on the awareness and the activities of individual developing countries. To support such activities is something we Swedes are really seeking to do.



ERNST MICHAEK

DIRECTOR GENERAL OF THE SWEDISH INTERNATIONAL DEVELOPMENT AUTHORITY  
"All children should be welcome children"

and other methods, but further research is required. This is why so many family planning programmes are still experimental and have to be. Another enormous problem is that of distribution — communications and physical dissemination of means, be they pills or condoms or any other mechanical or chemical thing. Thus, from this point of view the sums that have been devoted to these programmes are very small.

**ceres** There is another element: what some people feel is the paternalistic approach of the developed countries, promoting family planning in other people's countries, the poor countries. But, as you

sion studied whether there is any advantage from an economic point of view to be derived from the further growth of the U.S. population and the reply is a flat no.

**ceres** Is this true for other countries?

**Michanek:** That is of course a question that each country must consider for itself. But would it be true to say that the population problem is particularly acute in Asia and not in Latin America or in Africa? On the other hand, it is very easy to see from the present statistics on world population growth that the number of people, whatever we do, is

# Nutrition — two views

## Kosaric: develop new technologies

Never before has our planet experienced such a tremendous population pressure and the inevitable stress caused by the need for a massive exploitation of world resources. The problem of feeding the exploding human population thus becomes one of today's most fundamental problems. We could therefore predict that, even for the very near future — a matter of a few decades — a gigantic effort is required to avert widespread starvation because the situation which now exists in several areas is rapidly spreading over the globe and particularly threatening Third World countries.

What can we do to prevent and cure this cancerous disease? Would better food distribution, diminished losses, improved yields and lower food prices solve the problem and avert hunger from our planet? The problem is, of course, far more complicated and it is not my intention to mislead the reader by offering a technological solution which would save the world. All our efforts directed to produce more food are useless and non-efficient in the long run unless the population is controlled. How to make this control efficient in the most painless way is mankind's most difficult problem. Only a worldwide population control effort that is well organized and disciplined may lead to success before it is too late. Without intending to be a pessimist, I see that our chances for efficient popula-

tion control within the near future are very poor. Today's population explosion seems an unavoidable development and we still have to wait for some time, to realize and actually feel the population pressure more drastically, before we level off the curve.

Looking realistically at the question of world food and demand, we can say that we are faced with a twofold problem: improve our present supply and distribution and feed at least the double of our current population by the year 2000. Is today's conventional agricul-

ture adequate and how long can this type of production carry on the load? It has still an enormous potential but it probably cannot, even with the best yield improved distribution and diminished losses, produce enough food twenty or thirty years hence. It is therefore fundamental importance to develop new methods and new technologies, to investigate all possible unconventional food resources in order to fill the gap in present and future food production.

These approaches and methodologies are becoming increasingly important

### Amino acid fortification of foods\*

There is abundant evidence from animal studies and observations on humans under controlled situations in institutions such as hospitals, schools and orphanages that improvement in nitrogen retention or growth occurs when either simple experimental diets or mixed diets typical of food intake patterns in certain regions are supplemented with the limiting amino acids. This is particularly apparent in infants and children who have been malnourished or have low protein intakes. At higher protein intakes, cereal-based diets can usually provide sufficient protein for disease-free adults, but this may not be true for adults suffering from acute and chronic infections or women who are lactating.

Supplementation effects have been observed mainly with lysine and methionine; in maize-based diets tryptophan is also limiting.

More precise information is needed on the protein and amino acid requirements of various population groups

and the extent to which the local diets meet these needs.

There is evidence that baking and cooking processes reduce levels of amino acids added to food products. Further studies are required to assess the loss due to different types of storage and from foods cooked for home consumption. There is a need to examine the nutritional, technological and commercial possibilities of using vehicles other than staple cereals for amino acid fortification.

The decision as to fortification of staple foods with amino acids will have to be made on a national basis. The target groups that can be expected to benefit should be identified and the desirability of amino acid fortification should be judged in comparison with alternative approaches to meeting national protein needs.

\* The material provided in the boxes accompanying these articles is from recent statements and guidelines made available by the Joint FAO/WHO/UNICEF Protein Advisory Group.

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## Naim Kosaric and Narendra Singh analyse unconventional food strategies

New possibilities are seen in the chemical and biochemical synthesis of basic foodstuffs and the utilization of food not suited for human consumption but basically for animal feed or fertilizers. These new possibilities might be of far-reaching importance not only for the developing world but also for the developed world which is now experiencing all the benefits of an "affluent society."

### Chemical synthesis

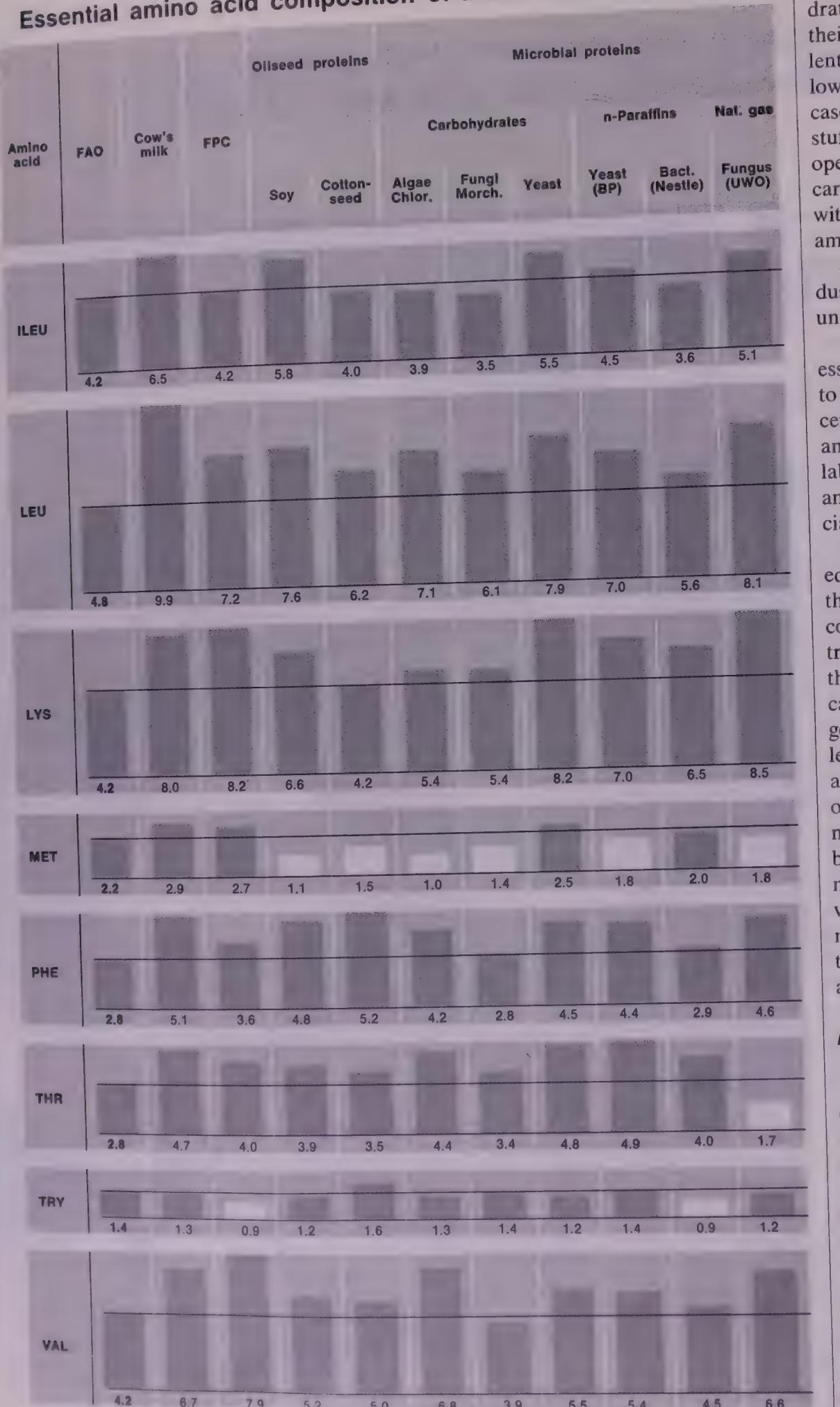
One possibility for future food production would be to synthesize our basic foodstuffs chemically on a large scale. This approach is not entirely new as we are already synthesizing many of the food materials such as vitamins, amino acids, additives, flavours, etc. Besides these, the chemist and chemical engineer are also able to synthesize sufficient quantities of our carbohydrates, fats and proteins (or essential amino acids) and this could be achieved by use of cheap and abundant raw materials or even industrial wastes. For example, food carbohydrate could be made by hydrolysis of cellulose (abundantly present) to glucose or to fermentable intermediate products which could, in this case, serve as excellent fermentation substrates.

One interesting approach developed by NASA, in the synthesis of carbohydrates, concerns the regeneration of food during space missions of long duration. The raw materials for this synthesis could be derived in the aerospace environment from metabolically produced  $O_2$  and  $H_2O$  which can be catalytically converted into edible sugars, using hydrogen and oxygen supplied by the electrolysis of water in the oxygen recovery system. Edible fats and oils can be produced by catalytic oxidation of appropriate hydrocarbons derived from petroleum. The hydrocarbon is in the first step catalytically oxidized into the corresponding fatty acid and its combination with



PROTEINS FROM PETROLEUM  
No side effects for 30 000 rats

## Essential amino acid composition of unconventional proteins



glycerol, also derived from petroleum would yield the desired fat product.

These two basic foodstuffs, carbohydrates and fats, and especially fats with their high caloric value, could be excellent energy-yielding supplements for the low caloric diets. However, in most cases the most limiting and critical food stuffs, and particularly in the less developed countries where diets are based on carbohydrates, are high-quality protein with a complete spectrum of essential amino acids.

Synthesis of proteins might be one industrial possibility and there is research underway in this direction.

The other possibility is to synthesize essential amino acids and to add them to low protein diets and diets deficient in certain amino acids. While all essential amino acids have been synthesized in the laboratory, there are only two, lysine and methionine, which are in commercial production today.

There are enough raw materials needed for these synthetic approaches and there is no reason why the process could not be developed and an industrial production of food established the same way as today's organic chemical industries, such as plastics, detergents, rubber, pharmaceuticals, textiles, leather, petrochemicals, etc. Our usual approach to the industrial manufacture of a new product is to make an economic balance and estimate the probability of a new industry. It might be much wiser in dealing with food to invert the approach and to estimate how much it will cost us or the next generation if we do not develop and establish an industrial food production.

### Fish protein concentrate

The great potential of fish protein concentrate (FPC) is especially in the fact that it can be made from abundant species, otherwise not used for human consumption, but basically for animal feed or fertilizers. The concentrate has a good nutritional value and represents a high-quality protein.

The process for its production has been developed considerably. It is a simple process, involving extraction procedures using various solvents such as hexane, isopropanol or ethanol to remove fat and flavour components from either whole or filleted fish. After

xtraction process, the product becomes colourless, tasteless and contains 70-90 percent protein. Nonsolvent extracted products are normally used as such for animal feed. The edible fish protein concentrate can be further improved for human consumption by eliminating grittiness due to bone and skin components.

further treatment might consist in chemical or enzymatic hydrolysis yielding product of 90-99 percent protein which is extremely low in oil and represents actually amino acids and small peptides which are considerably water soluble.

### **Oilseed and other plants**

There is a tremendous potential in the utilization of oilseed proteins as human

The United States produces about 70 percent of the total world soybean crop but only about 2 percent of it (300 000 tons) was used as human food in 1965-66. Comparing available quantities of oilseed proteins, which are abundantly lost for humans, we can easily calculate that there is enough protein available from oilseeds alone to fill the world protein gap for some time to come.

Commercial soybean products do exist today in various grades. The highest quality soybean isolate is almost pure protein obtained by protein isolation and precipitation. It is used either for fortification or for the production of textured meat substitutes. One disadvantage of the lower grades is the presence of oligo- and polysaccharides composed

beer, cheeses, yoghurt, soy sauces and others. Their use as a source of protein is increasing in importance primarily because of the world food shortage and after achieving a better understanding of the microbial world.

There are several advantages in the production of microbial proteins and they can be summarized as follows:

1) The production of most of the microbial proteins is independent of agriculture, climatic conditions and high quality soil. Consequently, a plant producing single-cell proteins could be erected anywhere in the world where raw materials, water and basic running power are available. This is of particular interest to some protein-deficient and agriculturally underdeveloped areas. The

### **FPC potential for developing countries**

FPC may be divided into two types, type A which is a bland, colourless powder of high protein and low lipid content, and type B which is a product of more or less distinct colour and flavour and which may be prepared in a variety of forms. Currently only FPC produced by solvent extraction meets type A characteristics.

Insofar as raw material is concerned, it appears that those fisheries which at present yield raw material for fish meal production are not likely to be capable of further extension. In fact, reductions in catches may be indicated due to conservation efforts. There appear to be large unutilized fishery resources in various parts of the world, but relatively scant information exists as to availability, length of fishing season, type of fishing methods to be used, etc. In general, fisheries are quite seasonal and even where seasons are long, the period of high catch rates is generally limited to three to four months.

Extension of seasons may sometimes be obtained by switching from one species to another. If a type of raw material suitable for human consumption is to be obtained, it must be expected that more careful handling and storage aboard ship will be required than that normally used for fish meal manufacture. The cost involved may be 30 to 40 percent above the cost of raw material for fish meal, using present techniques. It is assumed that economic calculations preceding any FPC venture would be based on a maximum of one hundred days of operation per year and provide an added profit to compensate for the considerable risk involved in any fishing venture. Ship-based FPC production may be a possibility, but higher capital and operating costs are involved. It may lead to a considerably extended period of operation, however. An economic selling price of about 35 U.S. cents per pound of FPC has been estimated.

However, detailed estimates in Chile have indicated the possibility of lower costs there.

FPC may be prepared from fish meal by extraction of the fish oil. Such products may be more economic, but conventional fish meal plants cannot produce a human grade fish meal. Also, the resulting product may not always be acceptable.

Based on basal diets of pure wheat, pure rice, pure maize, pure cassava, a Chilean diet, and an Indian diet, and making assumptions on comparative availability and losses of amino acids, and of the acceptance of hypothetical diets, it is estimated that FPC would have to sell for approximately 15 U.S. cents per lb to be competitive with other protein supplements, e.g., soy flour. In many cases, it may be more economic for a developing country to produce and export fish meal or other fishery products as such and to import a vegetable protein supplement.

Food and particularly because oilseeds are widespread and represent the cheapest and most accepted source of unconventional protein.

Oilseeds are mainly processed to extract the oils while the bulk of the rest of the plant, containing up to 50 percent protein, is used as animal feed. One of the oilseeds of greatest potential is the bean and particularly because of its abundance, representing approximately one third of the total world supply of seeds.

of raffinose and stachiose which might lead to digestion difficulties.

#### **Not a new idea**

Proteins derived by single cell multiplication deserve a special consideration as they represent a very promising food source. The idea to utilize single cells as food is not a recent development. Microbial cells and their metabolites have been used for centuries in various forms such as yeast, alcoholic beverages,

process is a rather complex one and once established, it does not require a large labour force but highly skilled personnel. The investment required is substantial, particularly when hydrocarbons are the substrate, but no dependable cost figures of the final product are available.

2) The biomass can be produced in the fastest possible way as the microbial growth rate (mass doubling time) is significantly in their favour over any other biological system. A hypothetical one

square mile fermentation surface would be enough, according to Humphrey, to supply enough protein for the whole world for one year. This strongly illustrates the microbial reproductive force.

3) A very attractive factor in single cell production resides in the fact that a wide variety of waste and cheap and abundant raw materials can be converted into proteins, combating at the same time the widespread pollution of our environment. Various petroleum fractions, natural and other industrial gases, cellulosic hydrolysates, molasses, food industry wastes, pulp and paper mill wastes, liquors, brewery and dairy wastes and many other waste materials containing hydrocarbons or carbohydrates can serve as substrates supplying carbon for the growth. As another growth requirement, nitrogen and other nutrients for the microorganisms can easily be supplied in the form of inorganic salts.

#### Five basic phases

Another advantage, which could be added to this list, is that raw materials are found in areas deficient in proteins or areas close to the deficient areas (e.g., petroleum and natural gas world distribution). Naturally, single-cell protein production presupposes the existence of a petrochemical industrial complex able to undertake it.

The process for single cell production from petroleum and natural gas is usually composed of five basic phases such as (a) preparation and sterilization of the liquid medium and microbial culture, (b) fermentation, (c) separation of the products from the residual fermentation liquid, (d) solvent extraction of the residual hydrocarbon (not needed in natural gas fermentation) and (e) drying and packaging of the finished product.

In the case of natural gas fermentation, as practised in our laboratory, the gas is bubbled through a medium containing essential mineral salts and inoculated with the culture. The system runs continuously at an acid pH (3.5-6.5) yielding a biomass containing 50-60 percent protein, 10 percent fat and 20 percent carbohydrates. No industrial process has yet been developed for this particular utilization of natural gas.

While some other unconventional food products have been more evaluated and investigated from the nutritional point

of view, this was not the case with single-cell proteins and particularly not with the product obtained from hydrocarbons or carbohydrate-containing wastes. There is a growing volume of information available, based on long-range

feeding tests and observations. The most significant effort to date is associated with the production of this material and also with its nutritive value and its toxicological evaluation.

Most published information on the nutritional, toxicological and biological value of single-cell proteins (SCP) derived from petroleum comes from British Petroleum Proteins Ltd. This company seems to have performed the most extensive nutritional studies in the world. Their product, single-cell protein (yeast) derived from liquid hydrocarbons, was fed to more than 30 000 rats, 1 000 chickens and more than 100 pigs mixed with a commercial feed in a proportion of 10-15 percent. Nutritional, toxicological and various biological values (reproduction, pathological changes, digestibility, etc.) were examined through several generations and no toxic or other side effects were reported. The product is intended to be used as animal feed for pigs and poultry, but the process also aims to develop food for human consumption.

The nutritional value of single-cell proteins can also be generally assessed on the basis of its chemical composition. On this basis, SCP compares well with high quality protein sources such as milk, eggs, meat and fish in terms of the amount of crude protein. This is, however, based on total nitrogen analysis which does not necessarily have to be a component of proteins alone. Nucleic acids, purines, pyrimidines, amino sugars and other minor cell constituents contain nitrogen as well and it is known that these compounds are, to a varying extent, present in single-cell organisms. The spectrum of essential amino acids of various unconventional food products compared to the FAO standard, is represented in the Table on p. 34. Methionine is persistently limiting in all types of protein derived from single-cell microorganism cultures.

Study and development of new processes and approaches for future production utilizing abundant raw materials are of primary importance today and in the following decades. Conventional food production, independent of agriculture and climatic conditions, is a promising approach if there are enough raw materials for massive production. Main attention should be focused in the short-

#### Single-cell proteins

There is adequate evidence to indicate that some species of yeasts, algae and bacteria can be safe and useful sources of proteins, vitamins and minerals, for animal and human feeding. However, the safety of such materials will depend on the organisms selected, the quality of the substrates utilized and the conditions of growth.

At the present time SCP products grown in purified petroleum hydrocarbon fractions are safely used in animal feeding at a practical level. They can be particularly useful in feeding poultry and swine. Hydrocarbon-grown SCP is not inferior in nutritive value to that grown on carbohydrate substrate such as molasses, sulphite liquors and agricultural waste. It can also be expected to make a considerable contribution to the amount of animal protein available for human consumption. No carcinogenic, mutagenic or embryotoxic effects have been observed from the use of such material in animal feeds and there is no adverse effect on the quality and safety of animal products produced in this way.

Yeasts grown on molasses, sulphite liquors and vegetable waste have established their safety and nutritional value when employed as a minor component of human diets. All the data from experimental and farm animals suggest that properly selected and produced SCP grown on purified petroleum hydrocarbons will be similarly useful, but appropriate clinical trials will be required before each product is approved for this purpose.

In addition to all other nutritional and safety considerations, the total amount of any SCP which can be employed in human nutrition is limited by the amount of nucleic acid it contains. Fortunately, there are a number of processes for lowering the nucleic acid content of intact cells to a point where this is no longer a limiting factor for food use.

It should be noted that the specifications and controls required are more stringent when SCP is produced for human consumption than when it is used for animal feed.

programme to develop technology and industrial processes which are expected to carry the major load in future food production.

One important approach is also to use industrial carbohydrate-containing materials and develop technology for efficient conversion of large quantities of waste cellulosic materials (or wood) into fermentable carbohydrate and proteins. Chemically synthesized food, fish protein concentrate and oilseed protein meals have prerequisites for human consumption. Some of the less biologically refined new food products, like single-cell proteins, could at this stage be used

to replace fish protein concentrate and oilseeds in animal feed. This switch would at the same time provide more information on the nutritional value of microbial foods.

There might be a possible problem in the utilization of single-cell proteins as human food because of the higher nucleic acid to protein ratio which at higher levels may give rise to high urea and uric acid blood levels; however, methods to produce low nucleic acid cultures or eliminate nucleic acids by technological treatment have recently been developed. Allergenicity to the unusual proteins should also be considered which

is possible especially in infants suffering from lesions of the gastro-intestinal tract. In addition to this, we have to be prepared also to face some unknown problems associated with new food to which we are not yet accustomed.

Complete information on the biological, nutritional and toxicological factors as well as acceptance of the new food products is imperatively needed for their evaluation. This information might significantly influence our unconventional food strategy indicating the right value and need for development of this most advanced revolutionary approach in food production. ■

## Singh: research is on the wrong track

The last few decades have witnessed strong experts all over the world and the part of the international agencies, particularly FAO, WHO and UNICEF, a great buildup of serious concern with, and highly publicized crusade against, protein malnutrition and its growing acuteness especially among the less privileged people in the developing countries of

Third World. Stimulating research has led to new sources and new processes increasing the supply and improving the quality of protein foods. A wing fund of basic knowledge on the harmful effects of malnutrition has accumulated during this period. It is time, now, to assess the relevance of these efforts against the practical realities.

The situation regarding protein malnutrition, in an overview, may be summarized as follows. In the industrialized, developed countries, problems arise not from a real shortage of protein foods, but from the social and economic trends promoting unbalanced and over-emphasized shifts toward animal meats and other foods, as products of sophis-

ticated technology, centralized processing and labour-extensive production systems, and leading to rising costs of food. In the underdeveloped countries, the supplies appear to be short, but more significant is the nonavailability of adequate and nutritious food for the great mass of the common people, due only to economic factors. The situation is made more acute by the widening economic disparity locally between the affluent minority and the poor majority, and from the widening economic and technological disparity between the developed and underdeveloped countries. Thus, the problem of protein malnutrition in general has persisted and continues to be aggravated, not so much from short supplies of protein foods in different parts of the world as from social and economic factors.

### Biased market economy

In the field of protein food production and use, some trends may be seen. In the industrialized countries, progressively growing labour-extensive and technology-oriented approaches are leading to increasingly intensive animal production, with increasing shifts to greater grain dependence in ruminants and to greater nonruminant production. The most obvious emphasis on poultry meat

stems from the broiler's ready amenability to technological handling and processing. The overall consequences are progressively decreasing efficiencies of animal and total agricultural production in terms of land.

The inevitably increasing costs of animal foods are accompanied with intensive promotion of textured vegetable proteins (TVP) as meat substitutes in the name of cheapness, but essentially because of the technological amenability of the raw materials used. The increasing dependence on technology and capital in food production and processing, despite the inefficient resource utilization and adverse economic and nutritional implications for the common man, arises from the dictates of the profit-motivated enterprises of large industries and multinational corporations.

In the underdeveloped countries, the forces of a market economy and a consumer society operate in such a way as to render more expensive and scarce the indigenous, nutritional, traditional animal and plant foods formerly accessible to all. These commodities are now diverted either to satisfy the growing demand of the affluent minority or exported and processed accordingly, in local plants. At the same time a shift from staple food production to cash crops also occurs, for the same

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reasons. Regardless of the state of production and supply of raw materials, food processing units multiply. Examples are: increasing numbers of milk processing centres (fluid milk, milk powder, cheese, baby foods, etc.), meat processing units, poultry feed manufacturers and broiler farms, edible oilseed meal processing units, and other food and feed processing centres.

Even the various benevolent programmes, promoted by international and other foreign agencies in the name of better nutrition for the underprivileged, centre around production and distribution of processed protein foods and mixtures.

### Beyond reach

The overall emphases continue on technology and capital-oriented production and processing, with increasing dependence on the multinational corporations based in the developed countries. In consequence, the traditional nutritious foods — and all the more so the processed ones because of still greater costs — remain beyond reach of the rural and urban masses with their growing impoverishment and diminishing purchasing capacity.

The relationship between work performance and nutrition was an early discovery. This was followed by knowledge of the need for better nutrition for growth, later even for brain development, going back from childhood to the earlier infancy and the pre-weaning period. Later discoveries have shown the need for better nutrition of the mother during pregnancy, then during all her life, then of the mother's mother and lately even of the mother's father. The role of nutrition in the earlier ancestors may be in the findings yet to come. The importance of the family and surrounding environment, and of the overall social, economic and psychological environment, in both distant and immediate past, has also been indicated.

What is the practical significance of all this information? Not only has this "awareness" led us nowhere closer to solving the practical problems of the needy, but it has proved to be not really as new as might be thought. In all agricultural societies, as part of the accumulating empirical common folk knowledge, mothers have known the need of

their pregnant or nursing daughters for better nutrition for satisfactory growth and development of children. Purchasing power has always remained the sole limitation.

Protein research shows several new promising sources and processes. However, it also reveals a bias in support of the further development of some and not others, regardless of the questions of production efficiencies, cheapness, simplicity in processing, and other factors. One may refer, for example, to leaf protein research started over 40 years ago and to the petroleum-grown yeast protein (SCP) research, only about 10 years old. Both are presented as foods of the future by experts of international repute, but in practice it is SCP which is given extensive backing. Even the waste carbohydrate-grown yeast and fungal proteins have failed to get support.

In terms of total production efficiencies on land, however, leaf protein in integrated programmes with fodder production has very obvious advantages. But research in this area remains negligible compared with other materials, including soybean, even in countries dependent on import of such materials and incapable of growing them locally. In general, material and process-improvement research continues receiving major attention for developing meat extenders, cheap meat substitutes, protein fortifiers of beverages and fruit drinks, etc.; but alongside are glaringly missing R & D efforts to check decreasing, and to promote increase in, animal productivity in terms of land use, to improve overall land production efficiencies, and to forestall the rising costs of common animal and other foods.

This general pattern of research and development regarding protein foods prevails in the protein-deficient underdeveloped countries as well. The Indian example may be cited. The predominant emphasis in R & D for technology and processing far outweighs attention to increased production and availability of simple protein foods, such as legume pulses, buttermilk, etc. With no concern for the raw materials themselves, the experts go on highlighting milk and meat extenders, based on technologically processed vegetable and other proteins. Research on TVP gets promoted on priority for producing chewy meat-like products, even in this most publicized

vegetarian country. Petroleum-based SC research gets very much more support than the highly potential leaf protein. Lysine supplementation of cereals, baked bread or elsewhere becomes significant R & D activity, overshadowing the well-known mutual supplementary benefits of cereals and legume pulses in the traditional and common dietary patterns. Genetic improvements of cereals for protein and for lysine, to make them complete single foods, are major R & D themes accompanied by the slogan of the developed countries. Soya bean research finds extensive promotion for attention as an oil protein crop. This when the groundnut is an established high oil crop, and the soybean does not even fit in the common diet as a cheap traditional food. R & D on local raw materials (e.g., groundnut and legume pulses) either gets downgraded under the pressures of the use of imported raw materials or mixtures, like CSM (corn, soya and milk from the U.S.A.), with the existing processing units closing down, or receives some support only when geared to production for export of the processed materials (e.g., edible grade groundnut meal). In consequence, under the guidance of experts from North America and Europe, the obvious trends in R & D are toward the use of technological raw materials and their industrial processing for purely market economies.

### Inevitable models

A serious analysis of the factors operating behind such R & D trends shows that the scientists and experts, while sincerely professing social motivation, have apparently suffered from certain socio-psychological tendencies. They have considered R & D achievements and applications (in food or otherwise) as independent outgrowths of their individual efforts. Divorced from the history of social development, they have been viewing their own socio-economic system and their own socio-cultural attitudes as inevitable models for all others. One must keep in mind that almost all research inspiration and motivation even in the underdeveloped countries has been conditioned by science education and training along the patterns of Europe and North America, with their environments permeated with ideologies of individualism, free enterprise and



FROM THE FAR EAST A PARTIAL ANSWER  
Ramie (*Bohemeria Nivea*) one of the best protein-yielding plants

market economy. Generated from their us in society and in the world, the ings of self-developed elitism, pater-nism and benevolence give rise among academics to an outspoken and ob-ive concern for the problems of others: less privileged elsewhere. They fess to take upon themselves and en- in tasks to solve such problems. In practice, however, the trends in R & D and the developments in produc-tion continue to be essentially shaped by the interplay of the ruling economic and political forces on the national and international scene. One may, for example, even refer to leaf protein, SCP and soybean, in attempting a brief analysis. In its early stages, leaf protein research in the U.K. found official support during

the impending crises of the last world war, but none afterwards. Later efforts have continued mainly under "philanthropic" support, aiming at solving the protein needs in the poor countries, with a very minor proliferation of interest in the latter and only from personal contacts. The nature of raw material (local, fresh greens not amenable to cheap and easy transport), the purpose aimed at (for the poor in uncertain areas), and the level of technology pursued and recommended (simple, low capacity and low capital biased) did not prove to be ready incentives for the ruling forces to give active official and economic support to leaf protein research. It just did not qualify for promoting their interests, i.e., capturing markets for profits.

In contrast, the much more recent SCP research received from the start all sorts of ready support from petroleum and other interlinked economic and political interests. The discrimination from an interplay of the forces of vested interests finds one of its most obvious expressions in SCP and leaf protein. During the last few years, some official support for leaf protein has become evident, but only in countries where research is pursued as an adjunct to the established feed dehydration and processing industries (e.g., U.S.A.), or for replacing the imported feed ingredients (e.g., Hungary) or the imported food ingredients (e.g., Sweden). This generates some interest among the equipment manufacturers as well.

Soy interests have extensively supported specific R & D use of the soybean. TVP promotion is the latest manifestation of their pursuits. In India, even research on groundnuts was supported by North American interests because of the market potential for soybean technology. Now, overt and covert promotional pressures have started to displace groundnut by soybean, even in raw material research and development. More detailed analyses in diverse fields of protein foods would produce additional evidence of discriminatory support, a common pattern operating in both the developed and underdeveloped regions.

A new emphasis and reorientation in approach are very necessary. The giant corporations of the industrialized and developed countries aim consistently at increasingly capital- and technology-intensive systems of production, nationally and internationally. But this has no relationship with socially useful R & D, which demands conscious and positive action in the interests of com-mon people everywhere.

In the light of past experience, the most obvious need is to give up, and to expose the dangers and fallacies of, the paternalistic and benevolent feelings of a self-imposed obsessive concern of an elitist status group for the less privileged. This attitude not only condones the privilege-ridden social systems, but even ignores that the problems of food and nutrition, as others in such societies, require economic and political solutions, as the first steps, involving a complete overhaul of the social system itself. Engaging purely in research, technological and management solutions, or proposing

them through local or foreign experts and agencies is not only irrelevant, but plays into the hands of vested interests, causing a further aggravation of the problems. It must also be realized that no research on even the most promising sources and processes could really progress and be socially useful unless it serves the needs of the local people and gets the support of the national interests.

Nor can research be really useful unless it simultaneously opposes inefficiencies and inequities arising from the operating socio-economic and technological system, and actively promotes improve-

ment in the exploitation of resources and processes toward greater production and wider availability of the materials.

In the industrialized countries, R & D programmes on novel protein sources and processes can have no real social meaning unless, while exposing the growing inefficiencies in the current food protein production systems, they aim at increasing the overall production and availability, and at reducing the costs, of common protein foods. In this, efforts have to be toward developing sources and processes to decrease the grain dependence in animal production, including

the nonruminants, and to reduce the dependence on imported feed and food ingredients. R & D programmes on leaf protein, for example, must aim at the use of juice and coagulated material as feeds for nonruminants and young cattle, and as meat extenders in human food, in close integration with fodder production from the intensively fertilized green forage and other by-product greens of local agriculture. Special efforts for R & D and knowhow, free of proprietary rights, would enhance their social value by availability and use toward solutions everywhere.

technology among the common people accumulating information by nonsubversive and growingly self-reliant R & D to serve the interests of the common man and, most important, active participation in the struggle for liberation, freedom, democracy and progress. Science and technology in general, and R & D on protein or other foods, have no meaning unless they follow the above aims.

For a general guideline, one may begin with a reference to the recommendation of the White House Conference on Food, Nutrition and Health, held in Washington in 1970:

## Leaf protein concentrate

With regard to the present interest in the development and use of various "unconventional" protein concentrates, though recognizing the limitations on them, the PAG does not feel it appropriate to give a simple recommendation for or against further work on leaf protein. It notes the good biological value and useful vitamin A content of leaf protein; the many sources from which it can be prepared; the several forms that the product can take; and the possibility of integrating production with the preparation of other products as a means of reducing costs.

The Group, however, draws attention to certain disadvantages of leaf protein compared, for instance, with oilseed protein concentrates. These are in particular its colour, flavour and lack of stability in the less processed forms and its lack of economic competitiveness in the bland, stable powder form. The balance of expert opinion from various research groups is that the

idea of small-scale village production of the crude leaf protein product is impractical. PAG endorses this view.

Leaf protein has then to be judged in terms of the bland, stable powder form, which would be produced on a large scale and which would, therefore, be exposed to direct economic competition with oilseed protein concentrates and perhaps eventually with fish protein concentrate and single-cell protein as well. As with certain of these other products, the Group sees the possibility that leaf protein might be considered initially as an animal feed supplement.

A crude product, produced from alfalfa and containing 70 percent protein, is likely to cost at present 10-20 US cents per pound, not including profit or marketing costs. For a solvent-extracted product, the price would be two to three times higher, even with the economic benefits of large-scale production (25 million pounds per year of product).

PAG recognizes that further research on a laboratory and pilot scale into the feasibility of leaf protein sources and methods for their extraction would be most desirable in appropriate institutions.

In view of the large amount of data already available and the limited practicality presently indicated, it does not accord such work a high priority or recommend the use of funds intended for the assistance of developing countries.

PAG feels that any major expenditure on large-scale processing operations in a developing country, even if these were of an experimental nature, should only be embarked upon after a thorough feasibility study. This would take into account all the relevant factors such as type of product, process control, manner of distribution and costs of production (estimated reasonably from earlier work) and comparison with alternative routes to the aid objective.

ments in exploitation of resources and processes toward greater production and wider availability of the materials.

In the underdeveloped countries, the experts have an even greater responsibility: to assist, in all possible ways, the political process of a complete overhaul of the socio-economic system. Their approach both in their specialized fields and in general has to be very much integrated, comprising mainly the following aims: increase in availability and in production of materials in forms and at costs amenable to the largest majority of local people, opposition to economic and technological imperialism, developing self-reliant agricultural and industrial production, proliferation of science and

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"The problem of malnutrition should be attacked with emphasis on nutritious and traditional foods that people are accustomed to consuming... and the thrust of our efforts should be toward protecting and developing this supply. This should not preclude the fortification and supplementation of traditional foods and development and introduction of new foods, particularly such new food products as may offer significant nutritive value at low cost. The latter, however, should be presented and should find their place... on their merits and not as special food for the poor."

# Civil servants fail to serve

One of the cherished goals of developing countries committed to the democratic way of life is to bring the administration nearer to the people. This means to bring the people into an ever increasing participation in government activities and to give proper attention to their needs, fears, hopes, likes and dislikes. The test of good administration, according to this concept, is the sense of general satisfaction that it generates among the people whose affairs are being managed by the administrators.

Unfortunately, this important goal of administration is yet to be realized in most of the developing countries, mainly because of the attitude of a good majority of administrators. The legacy of the colonial rule lingers on and the relationship between the administrators and the public continues to be that of master and servant in spite of all professions to the contrary. In some sense the situation has even worsened, for the dedication, efficiency and honesty that the colonial rulers showed in their task of administering the country is now found largely missing. Today's administrators seem to act as obstacles rather than links between government services and people. With few honourable exceptions, they consider themselves as benevolent despots, emphasizing their powers more than their duties and responsibilities. They have made very little effort until now to identify themselves with the people with the result that the latter view their activities with distrust and suspicion.

But, however uninterested the administrators might be in the welfare of the people, the points of contact between the

**in the developing world,  
says the author,  
the public official  
must also  
play the role  
of community leader**

**by MAHMOOD AMINUL ISLAM**

public and the administrators have vastly increased and are spread over an extensive area. This has happened because the state, acting on the concept of the "welfare" state, is trying to initiate and regulate all matters of public interest as well as all matters of social and economic development. There is again a growing tendency in modern legislature to enact only broad policies and to leave their implementation to the executive with the vast powers of decision entrusted to government officials. Then, every country has certain national objectives which it aims to achieve and the government of the day is, obviously, the instrument through which these objectives and aspirations must be reached.

There is perhaps hardly any field of human activity in a modern welfare state where the government has not got some effective role to play and this in turn is done through government officials. The administrators tender advice on highest policy matters and carry out decisions on operational policies and programmes.

In developing countries, the public official must also play the role of community leader, besides discharging his routine functions. He has to guide, assist and win the cooperation of the local people's representatives in developmental matters and particularly in ensuring the successful implementation of policies. He must provide leadership until the people become politically mature and sufficiently advanced educationally to take over the responsibility of running their own democratic institutions. Besides the task of evolving policies and implementing development plans in the various spheres of national life, the administrator must also discharge many functions of a regulatory nature and come into contact with the public on a man-to-man basis, imposing all sorts of con-

trols and insisting on the observance of certain prescribed standards of conduct.

A question then, arises: are the administrators in the developing countries equal to the task of discharging their onerous responsibilities conscientiously and efficiently?

### **Double standard**

If the past is any guide, most of them are not. Their most serious defect is that they are not imbued with the spirit of service. They fail to merge their personality with their work and live according to a double standard in their private and public life. To them, Government service represents a gateway to easy, comfortable (even luxurious) living, prestige and power. This fondness for easy life and lack of purpose prevents them from taking their work seriously, renders them lazy, superficial and insensitive to the hopes and aspirations of the masses. Indeed, the common man fails to discern any improvement in the attitude of the administration which is still plagued with inefficiency, corruption, nepotism, favouritism, callousness and conspicuous display of authority and power.

But good and honest administration is of urgent necessity in developing countries endeavouring to quicken the pace of development and improve the lot of impatient people in the shortest possible time. The responsibility of achieving this objective rests squarely on the administrators in the various technical and nontechnical spheres of activity.

It is therefore of the utmost concern for a government to improve the quality of its administrators, regardless of the difficult social and political circumstances in which they live and work. It would be much more sensible to aim the improvement at the source and method of recruitment of civil servants in the superior cadres of different nontechnical services (who provide the top leadership in administration) rather than concentrate on officials who are already in service and who have fallen in the rut of officialdom. It will therefore be quite in order to critically examine the system of recruitment to this administrative class of civil servants.

Since Pakistan is one of the countries where the civil service is particularly afflicted with shortcomings, let us take a

closer look at its recruitment policy. But before doing so, I should like to mention a case study carried out by a team of the Cambridge University Asian Expedition. It consisted of six members who made an on-the-spot objective study of the village of Budhopur in Gujranwala district in Punjab during 1961/62. The team stayed in the village for six months and learnt to talk to the villagers in their tongue. I will quote just one sentence from their report regarding the gulf existing between the administrator and the public:

*"In Budhopur the villagers' cynicism about the government servant seemed almost complete; from no matter what department, he was looked upon as one of 'them' (the sahibs) and therefore disinterested in the welfare of 'us'."*

In Pakistan, university graduates between 22-24 years of age appear in an open combined competitive examination for the Superior Services comprising the Civil Service, Foreign Service, Police Service, Audit and Accounts Service, Taxation Service, Trade Service, Postal Service, Secretariat Service, etc. The examination is conducted in two parts and in English: written test and *viva voce*.

### **The procedure**

In the written test carrying a total of 1100 marks — 500 marks for compulsory subjects and 600 for optional (academic) subjects — the candidates are examined in English essay and composition, general knowledge including everyday science, current affairs and Pakistan affairs (which are compulsory papers), and in academic subjects that they have offered individually from a wide range of subjects. Securing over 40 percent marks\* in the written test (marks below 25 percent in any paper are not added toward the aggregate) will qualify a candidate for the *viva voce* and the psychological test carrying 300 marks. He has to get at least 100 marks in the test, failing which he would be considered to have failed in the examination irrespective of the marks obtained in the written test. The ultimate success of the candidate therefore depends upon his ability to pass the *viva voce* and the psychological test.

The result of the examination is pub-

lished in order of merit based on the marks secured by the candidate in the written and *viva voce* tests. Allotment to different services is made from the list of successful candidates, subject to passing a medical test and verification of character and antecedents having been



found satisfactory, both according to merit and preferences of the candidate and quota fixed for each province. The candidates on appointment are to spend a probationary period of two years during which they receive training in the relevant field. On successful completion of the probationary period (passing of aca-

and departmental examinations) they are permanently absorbed into the service. (The above is a copy of the system of recruitment to the Central Superior Services followed in British colonial days with minor modifications here and there.)

lection process has its own merits it does not guarantee that a selected candidate has the aptitude for public service (which he is expected to discharge with devotion and integrity) and the capability to provide leadership to the people in all matters affecting their welfare.

Their knowledge is at best superficial and empirical, unrelated to the standards required of an administrator. Private business organizations, which operate much more efficiently than the government, recruit their officials according to the standard of their usefulness to the organization. Further retention and promotion of the employees depend on the same considerations. Evidently, we cannot compare a private business organization with a vast and complex government machinery; however, civil service recruitment should ensure, as far as possible, that government work interests in the various fields of activities should not be hampered.

### **Apprenticeship**

The future promise of a candidate for the civil service can be prejudged fairly accurately if his attitude and ability, his energy and initiative to serve the public conscientiously can be tested under actual field conditions before his appointment. This is possible through the introduction of apprenticeship into the system of recruitment.

The modified system of examination for recruitment to civil services in the superior cadre that I am going to suggest presupposes that there is no dearth of graduates in the country willing to offer themselves for government service (as in Pakistan); also that the terms and conditions of service, such as security of tenure, pay and other benefits, are good enough to attract young, above average graduates. The examination which would be conducted in the national language may be conveniently divided into three parts:

- (i) General suitability test,
- (ii) Written test, and
- (iii) Apprenticeship test.

The general suitability test would include basic intelligence and psychological tests followed by an interview. Eligible candidates — university graduates between 21-23 years of age and unmarried — would be first required to take the intelligence and psychological tests. In order to make the psychological test a reliable guide as far as possible for reading a candidate's mental attitude, a thorough investigation into his family background and his behaviour and activities in his school and college days should be carried out prior to the test.



AN ENCOUNTER WITH A CIVIL SERVANT  
*Will he seek cooperation or control?*

We have just seen that the principal criteria for selecting civil servants are scholastic ability coupled with proficiency in English of the candidates as judged from their performance in the written test, and their bearing and ability to talk intelligently and coherently as revealed during *viva voce* tests. While this se-

The new recruits are absorbed into the service before getting an opportunity to intimately know the public, whom they are called upon to serve.

It is wrong to think that as "sons of the soil" they are already familiar with the nature of the people and can serve and lead them without any special effort.

(preferably on receipt of applications) by some reliable agency of the government. If they are found up to the mark in the test, they will be interviewed by a Board constituted by the Public Service Commission (for the convenience of the candidates, the intelligence and psychological tests and the interview may be held one after the other in the same sitting). The Board will evaluate each applicant for his bearing, mental alertness and ability to talk intelligently and coherently on any subject he is expected to know as a well-informed man. The intelligence and psychological tests and the interview will help determine the general suitability of the candidates for the different branches of civil service. (Since it is the general suitability test, no mark needs be awarded for it.) This will cut at the root of favouritism alleged to be sometimes shown by particular members of the Board for particular candidates in the *viva voce* test.

#### **Neither scholars nor experts**

The candidates who will pass the general suitability test will be asked to take a written test meant to gauge the extent and depth of their knowledge as educated, well-informed and enlightened citizens and their power of expression. Since the objective of the test is the selection of administrators (generalists), and not scholars or technical experts, proficiency in particular disciplines that the candidates might have studied in colleges and universities may not be tested. This will be a departure from the present practice. The purpose of the written test will be adequately served if the following subjects are included. The standard of question papers will depend upon the general standard of the school and college education in the country:

- (1) National Language — essay and composition;
- (2) National History and Culture;
- (3) Functional English or any other foreign language in general use in the country;
- (4) General Knowledge;
- (5) Every Day Science;
- (6) Current and National Affairs.

A merit list will be prepared on the result of the written test — candidates getting less than 40 percent marks will not figure in the list. Those heading the list will be asked to serve as paid ap-

prentices for a period of two years without any guarantee of permanent appointment. The number of such persons will preferably be twice the number of vacancies in all branches of the civil service occurring in the year of completion of the apprenticeship period. After a brief orientation course on the duties and responsibilities of the administrator, administrative structure of the country, socio-economic problems and national objectives accompanied by visits to rural development centres and other institutions, the apprentices will be sent out to work in rural areas under the general control and supervision of the District Officers.

#### **Directly involved**

Each will be assigned a village or a group of small villages with specific tasks to perform and goals to achieve in the context of general socio-economic development, leaving enough scope to use his initiative and drive. He will also be asked to identify possible weaknesses and gaps in administration and read the people's attitude toward it. By living and working with the villagers (who constitute more than 80 percent of the population) he will gain an insight into their limitations, feeling and emotions which will stand him in good stead as a future administrator. He will record his day-to-day experience and at the end of the two-year period submit a detailed report of his findings and recommendations under separate prescribed headings. It will be forwarded by the District Officer with his assessment of the apprentice based on the latter's organizing ability, capacity for sustained hard work, flair for development work, sense of justice and fair play, quality of leadership and initiative. The report will be evaluated separately by an administrative expert and a sociologist with an economic background. A Board formed by the Public Service Commission will then consider the opinion of the experts, see the assessment given by the District Officer and award marks on the report. Anybody getting less than 40 percent will be automatically disqualified.

The final merit list will be based on the total marks obtained by the candidate in the written and apprenticeship test. Allotment to different services will be made by the Public Service Commis-

sion on the basis of the results as published in the merit list, the aptitude of the candidates as revealed during the entire process of selection and the preferences indicated by the candidates themselves. The first appointment will be on probation, during which the recruits will be sent to their respective Service academies for specialized training followed by practical assignments.

The new approach to recruitment of civil servants to the administrative class as outlined above has two definite advantages. The government is on a sure footing as to the quality of the young recruits without depending too much on their scholastic ability and outward smartness. On the other hand, the young man wanting to become a civil servant will have a real foretaste of the demands of the profession with its full measure of hardships, rewards and disappointments. He will also have no delusions about the standard of behaviour expected of him. Above all, the new element in recruitment, namely, apprenticeship, will help inculcate the spirit of service in the future generation of administrators which is so sadly missing now.

#### **Long-term process**

It may be argued that the young administrator, seasoned and sobered by two years of apprenticeship and trained during two years of probation, is likely to lapse into an attitude of arrogance and indiscipline unless he is made accountable for all his actions mainly through political control to be exercised by elected representatives of the people at all levels. But political control, in order to be effective, requires an honest, spirited and forward-looking electorate which is not the case in the developing countries. To prepare the citizens to discharge their rights and obligations in accordance with the best of democratic traditions, the administrators have a big role to play in educating the public and improving their standard of living by executing successive development plans. This will be a long-term process, and if, by introducing the proposed system of recruitment some improvement in the quality of the administrators can be made in the meantime, it is certainly worth trying.

\* The exact percentage varying between 40 to 45 is fixed every year according to the candidates' performance and number of vacancies.

# Rural employment — a primary objective — which cannot be reached without radical changes

by K.C. ABERCROMBIE

For several years now the employment problems of the developing countries have been a major concern of social scientists. Their persistence is one of the main reasons for the fashionable disillusionment with conventionally measured economic growth as either an adequate indicator of development or a viable path toward it. Governments too have become sharply aware of these problems, and see them as a serious threat to political stability.

Although with reservations about possible trade-offs with other objectives, development economists have for some time been exploring labour-intensive technologies and other measures designed specifically to promote employment. It has also gradually become accepted that agriculture's traditional role of releasing labour to the rest of the economy is, for the time being in the developing countries, subordinate to that of holding labour until it can be accommodated elsewhere. With this has come the realization that the employment role of the agricultural and rural sectors of the economy is crucial at the present time.

All this represents a big step forward. However, it begins to seem that current thinking may already be settling into a new conventional wisdom that is leading only to a series of piecemeal, palliative measures that have little overall impact. The lack of success in increasing employment opportunities is at least partly due to weaknesses in implementation, and it is clearly essential for those policies that have been identified as helpful to be pursued much more resolutely. But it may also be necessary to look for more far-reaching solutions.

The most obvious symptom of the employment problems of the developing countries is that people are migrating from the rural areas to the towns much faster than urban jobs can be created for them. Thus it was hoped at first that more rapid industrialization would bring the solution. But this was to forget some important differences from the development experience of the countries that industrialized earlier. The growth of the population and labour force is much faster than it ever was in the industrialized countries. Manufacturing technology has, in line with the progressive changes in the factor endowment of these countries, steadily become less labour intensive. The industrial labour situation of the developing countries is therefore more difficult at both ends — the labour supply is increasing much faster, and a given rate of industrialization demands less labour.

In the long run, only a more rapid increase in nonagricultural employment opportunities can provide a solution. The long-run position would also be greatly eased by a considerable reduction in the current high rates of population growth, which in any case is becoming more and more urgent for many other reasons as well. But it has increasingly been recognized that in the shorter run, when most of the population is still in the rural areas, and the agricultural labour force is still growing in absolute numbers in most of the developing countries, the agricul-

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tural and rural sectors are likely to have to bear much of the burden.

Most of the measures proposed for increasing agricultural employment have suffered from some inherent difficulties. There is seldom much scope for concentrating agricultural production on the more labour-intensive products, as is sometimes suggested, since the pattern of production must be largely dictated by the pattern of demand (although there is, of course, considerable scope for choosing more labour-intensive combinations of products within the farm enterprise). The possibility of increasing production by extending the cultivated area (which increases employment in almost direct proportion) is becoming steadily less — even where there is still much unused land, it is increasingly inaccessible and costly to open up. In the all-important field of the choice of technology, restrictions on the use of the most labour-saving types of mechanization are easy to justify and advocate but remarkably difficult to implement. Private costs are so far from reflecting social costs that in most of the labour-surplus developing countries it is more profitable for large-scale farmers to mechanize than to employ more labour. While something can be done through fiscal and foreign exchange policies to bring machinery prices more in line with social opportunity costs, labour costs will continue to rise with the spread of minimum wage legislation. And, even if it is possible to limit mechanization, this inevitably tends to block the main way of easing the drudgery of agricultural work, itself one of the causes of premature rural-urban migration.

Faced with these difficulties, there has recently been a welcome tendency to turn to the wider focus of rural employment as a whole. Much emphasis has been laid on measures to promote full-time or part-time nonagricultural employment in agricultural processing and other industries in rural areas, and on rural public works programmes. Proposals for the improvement of rural services and amenities have been widened to include the labour-intensive construction of decentralized rural towns (or the improvement of existing ones), which would both relieve the pressure on the overcrowded capital cities and bring a new dynamism to rural life.

Even in this wider focus, however, the approach has usually been piecemeal. There are as yet very few rural development schemes, and even fewer on a regional scale, in which the main emphasis is on the provision of employment.

### Possible new approaches

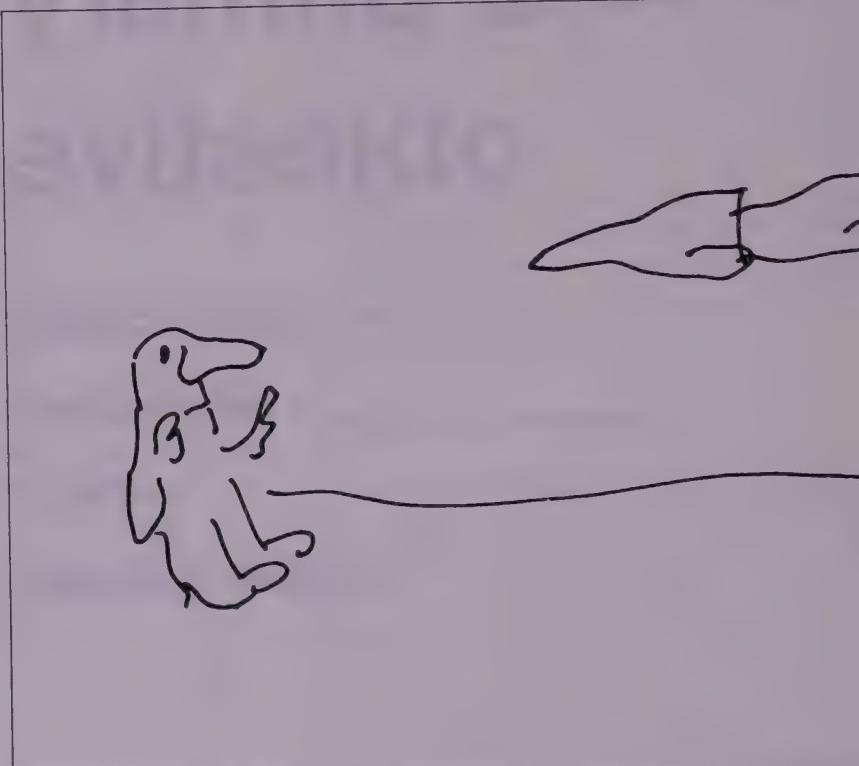
With the greater awareness of social problems that has come in recent years, it is now a commonplace to assert that employment, as well as human and social progress in general, must be regarded as primary objectives of development, no longer subordinate to (or merely hoped-for by-products of) the traditional objective of economic growth. Little thought has yet been given, however, to the changes in approach that are needed if employment is indeed to become a primary objective of development.

Most studies of employment promotion have concentrated on the measures needed to maximize the employment generated by a given volume of production. Important as this is, however, the first need — especially in the agricultural sector — is to start at an earlier stage, and to give greater emphasis than in the past to the demand aspects that are an important cause of

the problem. Second, as much attention should be paid to the distribution of employment opportunities as to increasing the total available. Third, there should be a change in the customary attitude to the productivity of labour. Fourth, and perhaps most far-reaching, agricultural labour should be regarded as a given resource in the combination of the different factors of production. And fifth, there should be some planning of rural-urban migration.

### Demand and employment

United States agriculture is justifiably proud of the number of people supplied by each farm worker. In 1970 this was 47, but the number goes up every year. The high figure is attributed to the immense productivity of American farmers (aided by those employed in the industries supplying them with inputs) but this is only part of the story. It is only made possible by the fact that farm workers are now only four percent of the total labour force, so that they have a very large number o



*The bigger share of any increase in employment will continue*

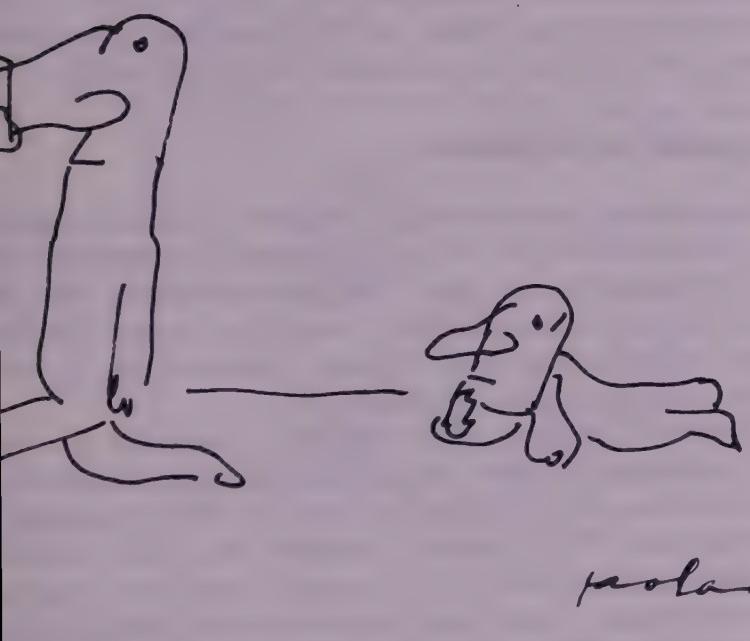
nonfarm people to supply with agricultural products in their own country, quite apart from considerable export outlets as well.

In the developing countries the situation is very different. Agricultural workers are still anything from 40 to 90 percent of the total labour force, so that their potential domestic market is very small. The nonfarm families are also most very poor in comparison with those in developed countries, that their consumption of agricultural products is much smaller. Export outlets are severely limited (partly because of protectionist policies in the developed countries). And the farmers who have to share these limited domestic and export markets are still increasing in absolute numbers in almost all of the developing countries.

Lack of demand therefore looms large as a cause of the underemployment of the agricultural labour forces of the developing countries, just as it was a main cause of the very differen

employment problems of the industrialized countries during the depression years of the 1930s. Recent FAO studies have demonstrated that, at least in Latin America, a region liberally endowed with agricultural resources in relation to its present population, the slow growth of demand is the main thing holding back a more rapid increase in production. Thus measures to stimulate demand through the redistribution of income and wealth and the lowering of trade barriers could have a considerable effect on employment.

Of course, it is also necessary to ensure that production is actually increased up to the level permitted by demand. There have been conspicuous failures in many developing countries to increase production fast enough, and in such countries demand has not yet become the major constraint on agricultural employment. In many countries there has been an increasing reliance on imports and on food aid, which in most cases has amounted to a transfer of employment and income-earning opportunities from farmers in developing countries to those in developed countries. Fortunately in the last few



*already enjoying a reasonable level of employment and income*

years, with the gradual progress of the somewhat prematurely named "green revolution," some developing countries have been able to make better use of their agricultural production and employment opportunities.

Demand also affects agricultural employment in another important way. It was mentioned earlier that the scope for a more labour-intensive pattern of production is limited by the pattern of demand. However, income redistribution not only increases demand, but may also change its pattern toward more labour-intensive products.

#### **Distribution of opportunities**

Thus rather small domestic and export markets for agricultural products have to be shared among large and growing labour forces. And the situation in most countries is greatly worsened by the agricultural structure, so that agricultural em-

ployment opportunities are not only very limited but also very badly distributed.

Generally a few large commercial farms, trying to economize on hired labour, exist side by side with large numbers of small family-farms with a shortage of capital and land but an overabundance of labour. In many cases the urgency of the food supply situation has dictated the need to concentrate government assistance on the former, where it can be most rapidly effective. Even in the many countries with no such explicit policy, the same result has accrued from the traditional biases in the land tenure system and in the operation of credit, extension and other government services. The small available market and employment opportunities have tended to be cornered by a few, and the rest of the agricultural population left with little to do except produce for their own subsistence.

The distribution of the available employment is of special importance because of the nature of most agricultural employment. Particularly in the developing countries, most of this is not divided up, as in manufacturing industry, into distinct jobs held by individuals. It is instead simply shared out — usually very unevenly, as just described — among the total labour force.

Thus, unless the circumstances giving rise to these inequalities can be changed, it is likely that the bigger part of any increase in employment will continue to go to those who already enjoy a reasonable level of employment and income. The rather meaningless statistic of the national average level of agricultural underemployment will be reduced, but without there having been much impact on the worst victims of underemployment.

#### **Productivity of labour**

A better distribution of employment among the members of the labour force implies changed attitudes to the productivity of labour. Increasing productivity of agricultural labour was a prerequisite for its transfer to nonagricultural activities during the development period of the industrialized countries. It is similarly a prerequisite in the developing countries today, for (despite the continued increase in the agricultural labour force) part of the natural growth of the rural population is all the time moving out of agriculture, so that part of the necessary expansion in agricultural production must come from higher labour productivity. But it is only when the agricultural labour force has begun to decline in absolute numbers that *all* of the increase in production must be found by raising the productivity of labour.

Using the advanced labour-saving technologies that have been devised to meet the needs of the industrialized countries, the potential exists for obtaining enormous increases in agricultural labour productivity in the developing countries. Such increases in productivity are bound, however, to lead not only to a reduction in the total available employment opportunities but also to a worsening in their distribution. With a small and only slowly expanding market that has to be shared among an increasing and largely underemployed agricultural labour force, only a slow rise in the overall level of labour productivity is possible. Increasing the productivity of land and capital is usually a much more appropriate objective than imitating the emphasis on labour productivity that is logical in the industrialized countries. If too great advances in productivity are

made by certain favoured members of the labour force, this must result in worse underemployment for many of the rest, since they cannot move quickly enough into nonagricultural jobs.

The need for a changed attitude to labour productivity also applies to some nonagricultural employment, particularly in certain service activities. Many will regard it as obstructing modernization, although at least in agriculture there is considerable scope for modernization by labour-intensive methods. A more serious objection is that increased incomes must come from increases in the productivity of labour, so that limiting labour productivity in agriculture will tend to increase the pressure to migrate in search of urban employment. However, as already noted, large increases in productivity would in any case be possible only for a few fortunate members of the labour force. Part of the answer must lie in establishing a new set of values which no longer look down on the traditional rural way of life, and in conspicuously increasing the rural share of government expenditures on social services and amenities.

### **Agricultural labour a fixed factor**

The agricultural labour force in the developing countries is virtually a fixed or given factor. The industrial labour force increases as jobs are created (or usually somewhat faster). The agricultural labour force is there all the time, and the new entrants are born into it instead of moving to take up jobs in agriculture.

Although it involves the same concept of keeping one of the factors of production constant, treating labour as the given factor is in strong contrast to the classical economics of agriculture, under which capital and labour are combined in variable proportions with a fixed quantity of land. Obviously it cannot be expected that large commercial farmers, using hired workers whom they have to pay at wage rates well above social opportunity costs, will take such a view. It is not, however, unknown in agriculture.

Something like this approach is taken in tribal agriculture, especially where land is not limited. Similarly, it is not difficult to visualize the production decisions of small family-farmers as being based on an attempt to combine as much land and capital as can be obtained (usually all too little under prevailing systems of land tenure and credit) with the labour abundantly available from the family. Indeed this is commonly the approach in linear programming and farm budgeting models for family farms. Family-farmers must take a very different view of the cost of labour from those who have to hire it at the market wage, even though the high value they place on leisure is often ignored, and they will not engage in additional heavy labour without some incentive. It is also possible to treat labour as a given resource under various forms of cooperative or collective organization.

### **Structural implications**

Each of these approaches leads to the same conclusion as regards agricultural structure and the organization of production. Large-scale commercial farming, using hired labour, must treat it as a variable factor of production and try to raise its productivity, and in doing so will limit the employment pos-

sibilities of the rest of the agricultural labour force. Small-scale family-farming or the different types of cooperative or collective farming, on the other hand, can give priority to employment as a development objective by treating labour as a given factor of production.

In many countries the expansion of the latter sectors implies land reform. However, if employment is to be maximized after a land reform, it is necessary to take deliberate steps of the kind suggested here. For example, in Chile, only the most recent changes in the application of the land reform involve the incorporation of labour from outside the former large private farms.

Depending on political choice, land reform can bring a variety of different patterns of farming — from state farms, through various kinds of cooperative, to small family-farms — each of which is capable of making employment a primary objective of development. Most of the more recent land reforms have led to cooperative farming systems, which have the advantage that they can be adapted both to the present need for labour absorption and to a future situation of labour scarcity requiring large farm units and advanced mechanization. At the leftward end of the spectrum of possible systems, the labour absorption policies and experience of the socialist countries, especially those like China and Cuba that still have large agricultural sectors, may be particularly worthy of study.

### **The concept of efficiency**

The socialized agricultures are frequently accused of inefficiency. But inefficiency in the use of labour is something that must be re-examined in the light of the need postulated here to treat it as a given resource, whose productivity cannot for the present be increased too much without adverse effects on the distribution of employment opportunities.

The overall efficiency of a country's agriculture, in the sense of providing sufficient cheap food and competitive exports, is of course of over-riding importance. This is probably the most serious of the possible trade-offs that have worried economists when they have come to consider policies for maximizing employment. But there is now a solid technological basis for the rapid, low-cost, labour-intensive expansion of production through the use of improved seeds, fertilizers and pesticides. Although the relevance of the experience of Japan to today's developing countries has been much exaggerated, it does provide the classic example of the possibilities of small-scale, family production. There are also many projects which testify to the fact that export products can be produced competitively under a cooperative system. Moreover, in most developing countries improvements in marketing efficiency offer a field for reducing costs that is as yet hardly tapped.

It is not suggested that the large-scale commercial farms on which the developing countries have relied so much in the past, especially for export production, should all be abolished or allowed to go out of business. What is essential is that they should not continue their present trend of expansion, swallowing up employment opportunities that are desperately needed elsewhere. It is particularly deplorable that, in some of the most green-revolutionary areas of India and Pakistan, the jump in production as a result of technological progress (combined with higher grain prices) has not been scale-neutral as it could

ave been, but has particularly benefited the larger farmers and enabled some of them to buy more land and oust their tenants.

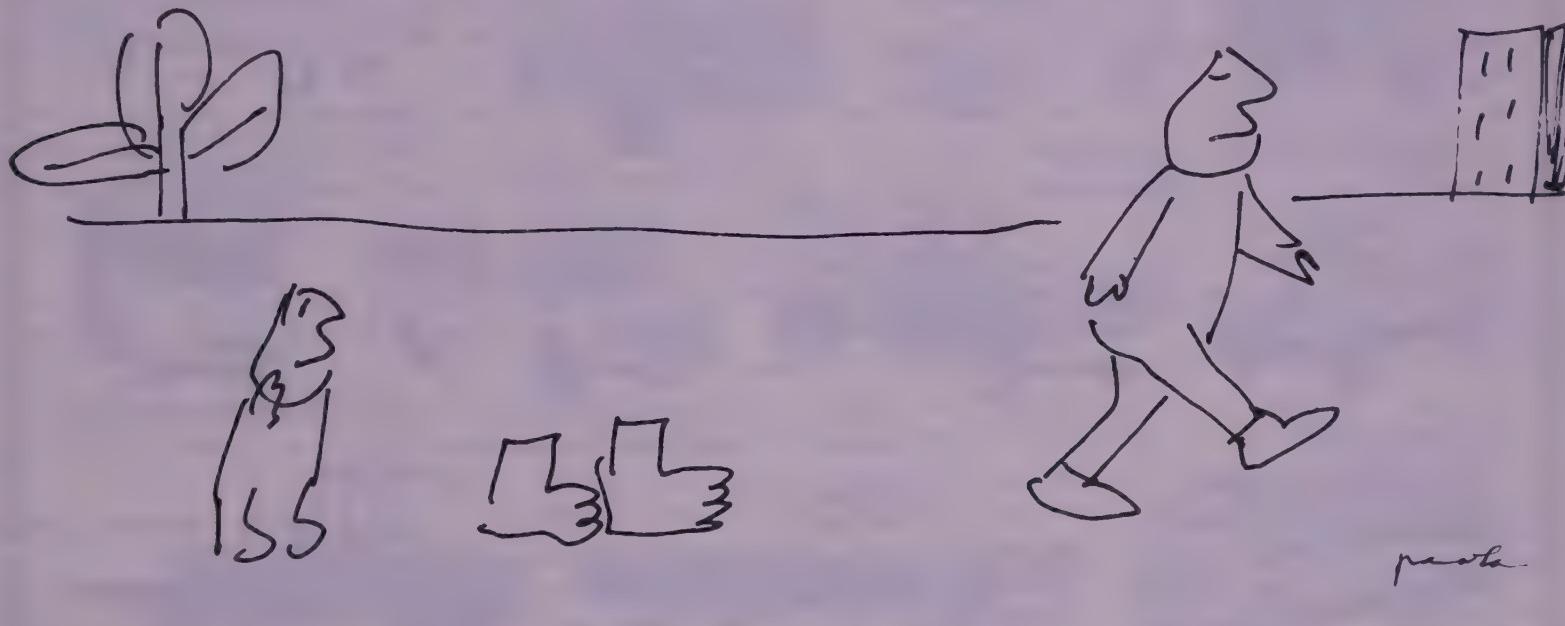
### **Planning of migration**

Nor is it suggested that the elevation of employment to a major development objective should permit the perpetuation of totally unviable mini-farms. The final element in the proposals made here is that there should be some planning of rural-urban migration. This basic phenomenon of development has hitherto occurred in entirely haphazard fashion, and it has often been the most dynamic elements that have left agriculture, even including those who have been given agricultural training by the government. The main aim has still to be to try to retain labour and make life attractive for it in the rural areas until the rest of the economy is ready to absorb it. But it would also be helpful to try to identify in advance those who have no

fact that a job provides a place in the economy or society and the possibility of participating in national development.

The employment difficulties through which the developing countries are passing are extremely serious, and they cannot be shrugged off as just growing pains of the kind that afflicted the developed countries at the time of their industrial revolution. In these countries industry absorbed labour at a rate close to that at which it was moving out of agriculture, and there was also the safety-valve of emigration. The main problem there was the hardship caused by inhuman working conditions in the "satanic mills" of early industry. The present employment situation of the developing countries results from an inexorable arithmetic, and could cause political unrest and instability on a scale that would jeopardize the whole development effort.

It is no use trying to pretend that the employment problems of the developing countries are theirs alone. Most of the world's work force is in the developing countries, but a



*The most dynamic elements have left agriculture*

able future in agriculture and should therefore be given priority in rural-urban migration. They might then actually be assisted to make the move (preferably to decentralized rural towns rather than the capital cities) through training schemes and the provision of job information.

The ideas proposed here concerning labour productivity and treating labour as a given factor of production will certainly seem heretical to those who are trying to create overnight in the developing countries an agriculture which is in the image of that of Western Europe or North America. And the land reforms implied in many countries would involve drastic changes in the political power structure. It therefore may well be asked why all this upheaval, both in basic concepts and in the structure of society, should be undergone just for the sake of increasing employment.

The importance of employment has nothing at all to do with outmoded concepts of the virtue of work as an end in itself. It stems basically from its close link with income distribution (especially in developing countries where the fiscal system is largely ineffective in redistributing income and wealth), and the

disproportionately large share of the work opportunities is in the rich, industrialized countries. Trade liberalization is needed not only to raise the foreign exchange earnings of the developing countries, but also to improve the distribution of employment opportunities. The only alternative would be vastly expanded international migration to the already densely populated industrialized countries.

None of the ideas suggested here is new, and it is certainly not claimed that, even in the particular combination in which they are presented, they provide a prescription for the solution of the employment problems of the developing countries.

Just as with the ideas described above as conventional wisdom, it requires much more than their mere acceptance as part of national employment policies for there to be any effect on actual employment opportunities. More coherent employment policies are badly needed, but they are useless without effective and rapid implementation. This becomes more urgent every day — not least because of the justifiably growing impatience of the youth who are most affected.

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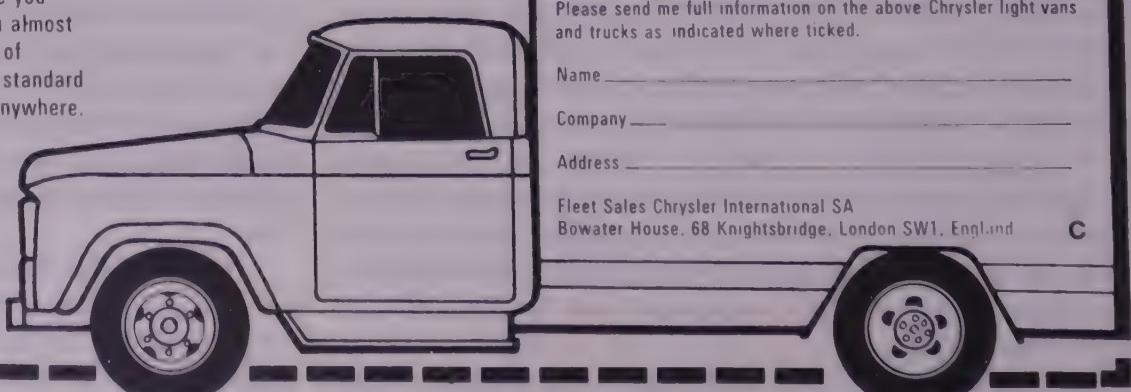
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# BOOKS

## A certain progress

*Réforme et mystification agraires en Amérique latine - Le cas du Mexique* by Michel Gutelman. Maspero - Documents et recherches d'économie et socialisme," Paris, 1971 259 p.), 18.10 F.

By different routes and at varying speeds, most of the Latin American countries are on the way toward resolving their problem of agrarian structures, often considered one of the main obstacles to economic development. Such is the point of departure taken by Michel Gutelman, who is opposed to a "good many Marxists and partisans of reformism of a populist type" (p. 11), whose anachronistic analyses reject reality or take shelter in matters of secondary importance (modalities of agrarian reforms). Does this mean that everything is resolved and the "consequent revolutionaries" have nothing more to say? Certainly not, the author replies, because agrarian reform is not an end in itself; it can only be appraised in terms of the power relations existing among the social classes.

## A knotty problem

Except in Cuba, Latin America's agrarian reforms are bourgeois reforms, with no other goal than "to adapt rural social relations to the development level attained by the producing classes when the capitalist production model rises and develops rapidly" (p. 14). Even Mexico, which has seen violent revolution and deep-rooted agrarian reform, must submit to this interpretation; it is not by chance, therefore, that the author chose Mexico to illustrate his theme.

Indeed, in Porfirio Diaz's Mexico, tormented by the ferments of capitalism, the agrarian problem was a knotty one. In an agricultural system where landowners and peons bore certain similarities to the lords and serfs of mediaeval Europe (p. 2-41), the invasion of private property and its consequences — expropriations, dislocated village communities, a peasantry converted into a proletariat — led to a evolution in which the bourgeoisie achieved power only by making concessions to the rebellious peasantry. The ambigui-

ty of the Constitution's Article 27, basis of the agrarian reform, and the successive phases of accelerating and braking the distribution of land, denote the instability of this relationship of forces. But capitalism indisputably won the day, not only because the common public land sector never managed to impose itself on all Mexican agriculture but also because it was itself threatened, from within and from abroad, by the expansion of private property and market relations. This development, an analysis of which provides the subject of the book's second part ("A Developing Capitalist Agriculture"), took shape in the form of a quantitative and qualitative concentration of land into the hands of a restricted group of agriculturists, who alone could accumulate property and profit from technical progress. This capitalist agriculture flourished in Mexico; at the same time, however, the social differentiations between the private and community land sectors, large and small private property, bureaucrat and community land proletariat, etc., became more sharply accentuated.

Could such a system of organizing agriculture resist the demographic thrust and growing discontent of the landless peasants? The author believes not, any more than he believes in "bourgeois" solutions (improving productivity by concentrating land and capital) or "agrarian" solutions (integral agrarian reform and expansion of the cooperatives). Mexico, like other Latin American countries, was running smack into the fundamental capitalist contradiction, which lies in "the conflict between private appropriation of the means of production and the land and the growing socialization of the production processes" (p. 243).

## Rigid interpretation

A complete discussion covering the scope of Michel Gutelman's theme, giving us a Marxist interpretation of all Mexican history in terms of agriculture, would be too long here; at any rate, he takes a clear stand in the debate on the capitalist-feudal nature of Latin American agricultural systems at the beginning of the twentieth century. In his view,

Mexico's position in the international web of relationships among the capitalist countries is not the same as that defined by other Marxist writers.

Does the evolution of Mexican society lend itself to such a rigid interpretation? Would Michel Gutelman be more convincing if he refrained from demonstrating at all costs what cannot be demonstrated (in the formation and transfers of plus values, for example), taking note of available evaluations? In a more general sense, the reader will regret that the author fails to link the agrarian problem more explicitly with the country's industrialization, nor does he attempt to make any comparisons with the agricultural evolutions in other Latin American countries. Despite its limitations, hasn't Mexican agrarian reform left room for a certain progress which we don't find elsewhere? Is the author's initial observation, therefore, wholly justified?

Jean-Marie Martin  
Grenoble

## Original tool

*The Philippines and Taiwan* edited by John H. Power, Gerardo P. Sicat and Mo-Huan Hsing. Oxford University Press for the Development Centre of the Organization for Economic Cooperation and Development, 1971, £4.00.

The gaining of independence of several Afro-Asian countries after the second world war brought to the fore the need for planned economic development. The choices in strategies were quite limited and often traditional, such as protection through import quotas, exchange controls, tariffs and incentives to export. The most original tool evolved during the recent two decades was organized overseas aid from the developed countries, with the United States in the vanguard, and from multilateral sources, such as the World Bank group and aid consortia.

In spite of these efforts, the performance in many developing countries has been disappointing. Some of them are engaged in a painful reappraisal of their policies and strategies. This book is therefore timely. It contains separate studies of the industrialization policies pursued

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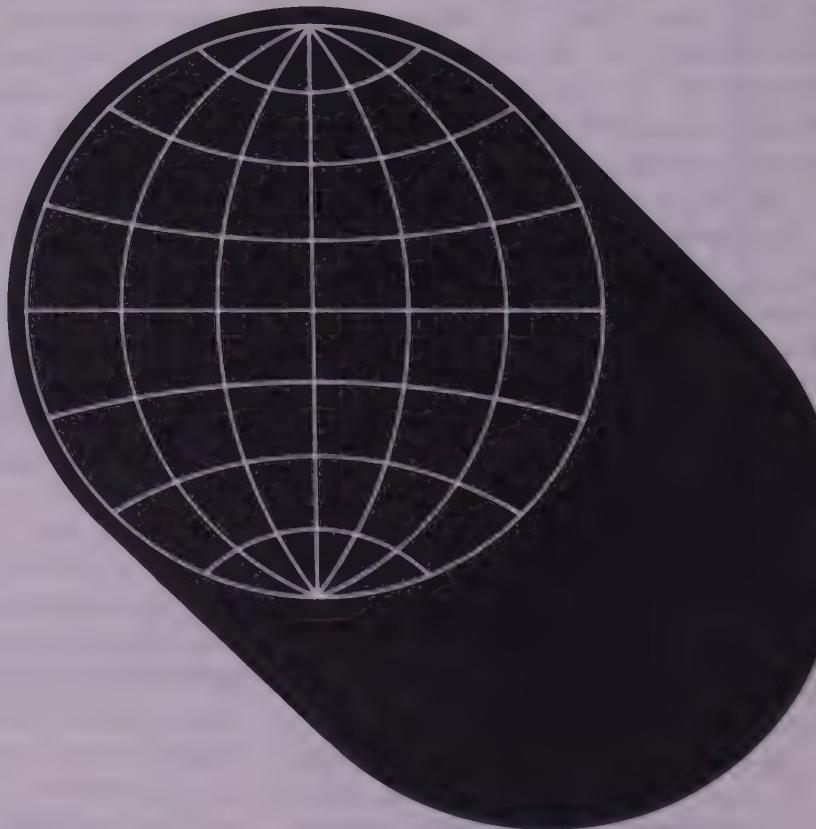
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in two countries, the Philippines and Taiwan, which provide interesting contrasts in methods and performance.

The study on the Philippines traces the history of economic growth and industries in this island nation since the U.S. occupation with particular focus on the 1950s and 1960s. It provides a critical analysis of the industrialization policies, describes the institutional setting within which these policies and processes operated, and offers some recommendations.

### **Industrial growth**

The study on Taiwan, on the other hand, deals only briefly with the historical background, but spells out in detail the strategies adopted for industrialization during the postwar period and the role of U.S. aid in industrial growth. These strategies are: i) direct control over industry; ii) foreign trade and exchange control; iii) tariff protection; iv) export promotion; v) encouragement of investment; and vi) provision of finance.

In the Philippines growth in the period 1902-18 was mainly due to the opening of the American market on a preferential basis. In sharp contrast, growth during 1952-68 was brought about mainly by manufacturing output stimulated by import and exchange controls, initiated at the end of 1949 along with tax incentives. These policies have obviously not only outlived their purposes, but have also led to adverse consequences such as: i) growth of inward-looking manufacturing industries, ii) their excessive dependence on imported inputs, iii) an undue reliance of the national economy on a few primary exports, iv) overconcentrated regional development around Manila, v) inequality of income distribution, vi) neglect of wage goods industries, vii) slow growth of industrial employment, and viii) technical and economic inefficiency. Input substitution in basic manufacturing and vigorous expansion of industrial exports supported by a new exchange rate policy are the suggested reforms.

Mounting defence expenditures and an ever-increasing population due both to natural growth and mass immigration of the mainlanders were two heavy burdens imposed on the economy of Taiwan, a comparatively small island. Yet the coun-

try has achieved a high growth rate on a sustained basis. The significant features of stability were: more diversified and increasing exports in relation to inputs, negligible fluctuations in general price level and black market exchange rate, fall in interest rates, and an increasing flow of foreign investments. While both agricultural and nonagricultural sectors recorded impressive progress, industrial progress was more prominent.

These achievements were the results of a sound strategy which treated economic stability as one of primary concern. The work of the powerful Economic Stabilization Board and later of the Foreign Exchange and Trade Commission is worth a more detailed study. Other important planks of the policy were "balanced" growth of agriculture and industry and development of infrastructure which included in its orbit power supply, transport, harbours, telecommunications, education and manpower.

If the aid contribution of the U.S. to economic growth was important, its influence on Taiwan's economic policy made a more significant contribution. "As a matter of fact," the book states, "almost all of the development strategies described in Chapter 3, and the major industrialization and trade policies to be discussed in Chapter 5, were influenced by the United States through the A.I.D. Mission to Taiwan" (p. 198).

### **Does not apply elsewhere**

What lessons can be drawn by other developing countries from these two interesting studies in contrast? In the absence of an adequate assessment of the agricultural and industrial base left behind by the Japanese in Taiwan, it is hard to come to conclusions about the contributions of a policy of balanced development of agriculture and industry. While innovations in industry are more easily adopted, those in agriculture call for greater applied research. The Japanese contribution to Taiwan agriculture, in this respect, is known to have been considerable. Therefore to draw conclusions for other developing countries from this study may not be realistic. Furthermore, although the Philippines and Taiwan were militarily tied to the U.S., the peculiar

position in which Taiwan was placed made acceptance of U.S. influence not only easy but also welcome. It may not be so simple a matter for other Afro-Asian countries to do likewise.

The development of infrastructure is said to have contributed considerably to rapid industrial growth in Taiwan. What part the development of harbours, transport, communications and power generation played in the strategy of economic development or in that of military preparedness may indicate its reproducibility in other countries. In both studies, little emphasis has been laid on the development of human resources as part of a strategy for promoting rapid economic growth.

*Rajamal P. Devadas  
Coimbatore, India*

### **Demographic dynamics**

*Aspectos demográficos de la mano de obra en América Latina* by Juan C. Elizaga and Roger Mellon. Published by the Centro latino-americano de demografía (CELADE), Editorial Paidós, Buenos Aires, 1971 (164 p.).

This book, as its "presentation" points out, is primarily a compilation of notes for a course in demographic analysis, to be used by analysts and economic activities planners.

In the first part (Chapters 1-4) they will find a good definition of the concepts used as a basis to characterize the employment aspects of a population. The art and manner of measuring its participation in economic activities are methodically described and illustrated by corroborative examples cited from the underdeveloped, semi-industrialized and industrialized countries of the Western hemisphere. The relations between these rates of participation and certain economic, cultural and social parameters, such as prevailing levels of technological development, education and social legislation, provide the subject of a special analysis.

The second part of the book, from Chapter 5 onward, is devoted to the demographic dynamic and to projections from both the conceptual and methodological standpoints. In economic activity, the authors inspect the incidence of the active population's evolution through time and space and its professional migrations from sector to sector.

# **SIMA-PARIS**

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The work's interest lies not in the material results of its analyses, which are based on old data taken mostly from the 1950-60 decade, but rather in its methodology — very standard in type, without any notable innovations — which the authors utilize to analyse present-day potential relationships between the population's demographic parameters and employment.

Bernard M. Ortolo  
FAO

## Social bomb

*Weltweiter Wohlstand* by Fritz Baade. Gerhard Stalling, ag., Oldenburg, 1970 (224 p.), DM 22.

Dr. Baade's latest book concentrates on three central themes: hunger, poverty and war. Like a military general determined to crush the enemy forces, Baade accepts the challenge of exploring ways and means to eliminate hunger, poverty and war from the face of the earth. From wherever you read the book, from the beginning to the end, the author has one message to convey: The world has progressed a lot; it can continue to progress further. But this is possible only if the content and distributive aspect of this development are made both universal and socially acceptable, not to the very few countries or classes but to the mass of the people in the whole world. In his own words: "We must see to it that the poor nations first succeed in reducing their poverty and then, in stages, achieve prosperity. If, however, we don't succeed, then the world as a whole is sure to suffer an explosion of a social bomb; this will be almost as destructive as the atom bomb." (p. 162).

Baade believes that one way of promoting this worldwide prosperity is to step up the volume of aid from the few rich to the many poor countries. Present aid-flows into India and Pakistan, for instance, are too small to generate the needed takeoff. The author strongly recommends doubling the present annual aid to India (US\$1 thousand million) and Pakistan (\$400 million). This aid is needed not for a few years, but for a very long time to come (p. 191). Why more aid? One index of the need is the

enormous number of people awaiting to be absorbed in the employment sector: 150 million unemployed and underemployed working-age men and women in India and Pakistan alone (p. 188). A substantial amount of this aid, as well as domestic resources in the developing countries, will obviously have to be devoted to providing alternative jobs to millions of workers now forced to scratch a mere existence in the vast agricultural sector. This is a must for any beginning of a self-sustaining development process. "Mass prosperity can only be achieved in those countries where only a small percentage of the labour force is engaged in agriculture and the larger percentage finds its employment in nonagricultural sectors" (p. 164).

The magnitude of poverty in the Third World is appalling. For instance, in 1968, as much as 65.5 percent of the total world population had a per caput income of \$200 per annum. As against this, the per caput income in the United States and the Federal Republic of Germany stood at \$4 000 and \$1 950, respectively. The description if stretched further would reveal that the per caput income in the U.S.A. and the Federal Republic of Germany was as much as 40 and 20 times that of India and Pakistan.

### Useful but...

Referring to the widespread use of the new high-yielding seeds of wheat and rice in the Third World, particularly in India, Pakistan, Turkey, Thailand and the Philippines, Baade comments: Though the Green Revolution will enable the many once heavily food-deficient developing countries to become independent of food imports, this development will, however, also create new and difficult problems. There is no doubt that the new developments in agriculture are quite far from absorbing existing surplus manpower in the developing countries (p. 178). A solution of this problem, in the views of the author, again is "The creation of new jobs outside agriculture . . .".

The author repeatedly praises the role played by Norman E. Borlaug in engineering the present Green Revolution. Professor Baade had already written in November 1968, in the journal *Stimmen der*

*Zeit*: "It wouldn't therefore be a bad idea to honour this ingenious scientist with a Nobel Peace Prize." Happily, Dr. Borlaug was awarded the Nobel Peace Prize two years later.

The Third World now faces the dilemma: to contain or sustain the Green Revolution. A smooth development, of course, will be dependent on the volume and quality of aid-funds flowing from the industrial into the developing countries.

### Too much for arms

Baade commends the role of migrant workers in the development of their home countries. This, he says, is the case particularly with Turkish workers in Western Europe and Pakistani workers in the United Kingdom. Both Turkish and Pakistani workers were able to remit about \$100 to \$150 million each year to their home countries in the recent past — probably more than what they get in aid and grants.

At the end, the author touches upon his most favourite problem "the mad race in armaments." In dealing with this issue, Professor Baade goes beyond the diplomatic language and does not hesitate to call a spade a spade. He criticizes the poor countries for spending huge amounts of money on armaments. Not only that, he also takes to task the richer industrial nations, which, in his view, are squandering hundreds of millions of dollars each year on arms and defence. Baade strongly believes that the richer countries would feel more secure if, instead of spending on armaments, they would free these funds for the welfare of the poor people in the world. He says: "... if the two richer nations of the world, i.e., the United States and the U.S.S.R., agree to reduce their large expenditures on armaments, substantial funds could be released toward fighting against mankind's three enemies, hunger, poverty and war."

Baade's present book is not something new. It is just a continuation of the author's ongoing fight against injustice. Though he is now 78 years old, his passion for truth and his courage still accompany him in his *tour de la justice sociale*.

M.A. Hussein Mullick  
Bonn

# SCIENCE AND TECHNOLOGY

This department is designed to provide information about some of the latest advances in science and technology as they relate to the field of economic and social development in general. This is an area which is moving ahead at a most rapid pace; and therefore the items below are not intended to be all-inclusive, but serve rather as a cross-section of science and technology news. Each item is followed by a reference to source and whom to contact for further information. The department, a regular feature of CERES, is contributed by Noel D. Vietmeyer, Ph.D.; Wesley Copeland, M.S., M.B.A.; and Norman L. Brown, Ph.D.

## FOOD

### Cocoa wine

Cocoa beans have been used to produce rum, whisky, brandy, and wine, and it is planned that cocoa wine (vintage 1972) will be produced at a new plant now under construction. A ton of beans processed into wine could yield about 14 000 gallons or 84 000 bottles. At US\$0.75 a bottle, this gives a total turnover of \$63 000 from one ton of beans currently selling at about \$560 on the London exchange. Research also shows that floor tiles, carpets, and ceiling boards can be manufactured from cocoa pods now thrown away as waste.

Okon Equere and Edet Ekanem, 478 Atu Street, P.O. Box 191, Calabar, South Eastern State, Nigeria.

### High protein soybean

A wide variety of foods have been developed from dry soybeans, processed to prevent any off-flavour development and to remove antinutritional factors. The entire bean, usually including even the hull, is used. Included are fresh cooked and canned products presently made with low-protein beans, a low-fat milk substitute with good stability, a soybean "butter," a diet margarine substitute, a series of dry weaning foods, a dry gruel, a frozen dessert and snack foods.

L.S. Wei, Food Scientist, College of Agriculture, University of Illinois, Urbana, Illinois 61801, U.S.A.

### Vegetable "milk"

Miltone is a vegetable protein toned milk, now manufactured in India at two plants,

one in Bangalore and the other at the Central Food Technological Research Institute, Mysore. It is made by mixing wet peanut protein isolate (instead of imported skim milk powder) with buffalo or cow's milk. The resulting nutritious milk-like beverage, having nearly the same composition and characteristics of milk, is now being used to overcome the shortage of milk, at a price 15 to 20 percent cheaper than skim milk, powder-toned milk and 25 to 30 percent cheaper than pasteurized full-fat milk. The Government of India is setting up three more such production units in other towns, besides enlarging the unit at Bangalore to a capacity of 25 000 litres per day.

M.R. Chandrasekhara, Chairman, Protein Technology Discipline, Central Food Technological Research Institute, Cheluvamba Mansion, Mysore 570013, India.

## PUBLIC HEALTH

### Plague preventive

Granules of plastic containing the insecticide dichlorvos have been coated with a food substance that masks the presence of the insecticide and makes them acceptable to rodents. When the rodents store the granules in their burrows, the dichlorvos fumes kill any fleas present and thus prevent the spread of plague. The granules work well in laboratory tests with the oriental rat flea, a major carrier of bubonic plague. They were also highly effective in the field against fleas on wild rodents. This method

could replace the time-consuming dusting of individual rat burrows and runways, which are often hard to find. Further investigation is required, however, to determine the effects in other species and on the environment. The method has an advantage in that, since the granules are exposed in bait stations, any that are not taken by rodents can be removed from the environment.

M.M. Cole, Entomologist, Agricultural Research Service, U.S. Department of Agriculture, P.O. Box 1268, Gainesville, Florida 32601, U.S.A.

## PEST CONTROL

### Housefly sex attractant

Muscalure is an experimental chemical sex attractant which can be obtained from sexually mature female houseflies. It is effective only with mature male flies, but can be used to reduce the housefly population. Although not as powerful an attractant as others which are known, it can be manufactured rather cheaply.

David A. Carlson, P.O. Box 1268, Gainesville, Florida 32601, U.S.A.

### Beetle trap

A chemical attractant for *Oryctes rhinoceros* (one of the most important insect pests of the coconut palm) has been discovered. Attractant-bait traps could be used in uninfested areas for early detection of the beetle, then eradication could be attempted before the insect became generally established. In areas which are already infested, the traps could be used to evaluate the eradication or control measures

or to control the beetles directly by combining the use of the attractant with that of an insecticide, sterilizing chemical, or known pathogen.

Peter Maddison, U.N./S.P.C. Rhinoceros Beetle Project, Box No. 597, APIA, Western Samoa.

## AQUACULTURE

### Foiling barnacles

Among the major problems of high-density culture of fish in cages placed in estuaries and marine areas is that the external mesh gets blocked by fouling organisms such as barnacles. This reduces circulation and consequently oxygen exchange and removal of wastes. To combat fouling, a cylindrical cage, which can be rotated intermittently on its axis, has been developed. As roughly half of the cage is out of water and exposed to sunlight and drying half the time, the organisms can be brushed and scraped without greatly disturbing the fish within the portion under water. No part of the cage need be left submerged for extended periods, thus reducing the quantity of organisms to be removed.

University of Miami, Rosenstiel School of Marine and Atmospheric Science, 10 Rickenbacker Causeway, Miami, Florida 33149, U.S.A.

## INDUSTRY

### Setting up small-scale plants

A series of booklets have been published which describe technologies to set up small-scale manufacturing plants. The entire process involved in the manufacture of the particular product (e.g., mineral powders) is illustrat-

## SCIENCE AND TECHNOLOGY

ed and diagrammed. Specifications of principal machinery, plant layout, general sequence of operations, and other information are presented. A careful drafting of a model plant is also included. The authors help the readers to determine the initial cost of operations as well as the break-even point. (Booklets at present available: Dry Cell, Paper, Mineral Powders, Tapioca, Heat Treating Facilities, Bolt and Nut, Welding, Printing, Ice-Making and Cold Storage, Corrugated Cardboard Sheets and Containers.)

Osaka Foreign Trade Institute, Osaka Prefectural Government, 58 Uchihonmachi - Hashizumecho, Higashi-ku, Osaka, Japan.

### Sulphur from ash

Elemental sulphur is now being extracted from volcanic ash by a solvent extraction process. A pilot plant capable of processing 1 000 pounds of ore per hour was built to obtain economic and design data for commercial scale-up. The sulphur is recovered by crystallization when the clarified enriched solvent is cooled. Volcanic ash contains between 20 and 50 percent sulphur.

C.K. Amano, Colorado School of Mines Research Institute, Golden, Colorado 80401, U.S.A.

## WATER

### Ground water sampler

A simple water-sampling device can be easily constructed from readily available, low-cost materials. The sampler can be used to obtain groundwater from auger holes and shallow wells (as deep as 26 feet) and even surface water from streams. Groundwater samples are often needed by scientists to more fully interpret soil salinity data, especially where the water table is near or within the root zone. It can also be used to find the water table depth. The only materials needed are a milk bot-

tle, a grease gun (or similar plunger-containing device) with check valves to create controlled suctions, plastic and metal tubing, and miscellaneous clamps, rubber stoppers, and connectors.

Lowell E. Allison, East African Agriculture and Forestry Research Organization, Sorghum and Millets Unit, Serere, P.O. Soroti, Uganda.

## ELECTRONICS

### Laser lighthouse

A prototype laser lighthouse — the world's first — has been constructed. The small mechanism weighs only 95 pounds, is 5 feet high, and stands on a 15-inch diameter base. Its brilliant red light is said to be clearly visible 20 miles away when meteorological visibility is 10 sea

miles. It is reported that the cost of a conventional lighthouse can range up to three times the cost of this laser lighthouse prototype.

Noel Walden, Laser Electronics Pty. Ltd., Southport, Queensland, Australia.

### Combating hailstorms

Radar units can be used to spot clouds where hailstone nuclei are forming fast and then rockets containing about 100 gm of lead iodide are fired into the cloud's centre. This seeding reagent reduces the size of the hailstone nuclei and usually prevents precipitation. The whole operation takes about two minutes. One radar installation can cover an area of 1 500 square kilometres.

Georgii K. Sulakvelidze, Tbilisi State University, Tbilisi, Georgia, U.S.S.R.

## AGRICULTURE

### Mechanizing tropical farms

Simple equipment to provide an intermediate level of mechanization for the 2-10 hectare tropical farms is being specially developed for local manufacture in developing countries with simple production facilities. This includes: (1) a 5-7 hp power tiller with various attachments for both lowland and upland conditions; (2) 6- and 8-row labour saving machines for seeding pregerminated paddy seeds on puddled soils; (3) a 3-row portable power-driven machine for weeding and other operations in small paddy fields which have no headlands for turning at the end of the row; (4) a lightweight 3hp engine drive-table thresher for high moisture paddy with a 350 kg/hr output; (5) a throw-in type 6hp engine drive-axial flow thresher for multicrop operations with 700 kg/hr output; (6) a high capacity (1.5 tons/hr) 30 to 60hp tractor power-take-off driven multicrop thresher for custom threshing opera-

tions; (7) a self-propelled stripper harvester to harvest paddy grain in the field without cutting paddy plants; (8) a 3-ton per hour capacity power-operated rotary grain cleaner; (9) a continuous-flow, rotary drum conduction drier using heated sand to simultaneously dry and parboil rice; (10) a simple foot operated bellows pump for lifting 50-60 gallons of water per minute at 3 to 4.5 ft head. Interested manufacturers can request drawings and other technical assistance on the above machines free of cost.

Amir U. Khan, Agricultural Engineering Department, The International Rice Research Institute, P.O. Box 53, Manila, Philippines.

### Farming saline-alkali soils

A high-yielding, highly digestible, sterile hybrid of Bermuda grass, called Coast-cross-1, has great potential as an improved forage crop for soils too salty to grow most other crops in the tropics. It is easily propagated from stolons. Lack of seeds and rhizomes makes control

and eradication easy. Grown on salty soils and removed for feed elsewhere, the crop could also lower the salt content of soils.

Glen W. Burton, Research Geneticist, Plant Science Research Division, Agricultural Research Service, U.S. Department of Agriculture, Tifton, Georgia 31794, U.S.A.  
L.B. Sing, Director, National Botanic Gardens, Lucknow, India.

## CONSTRUCTION

### Low-cost masonry

A simple, low-cost machine, the Cinva-Ram Block Press, produces building blocks and tiles from common earth. A slightly moist earth, with cement or lime as a binder, is compressed in a mould box by a hand-operated piston and lever press. The portable press weighs only 138 pounds and is suitable for "do-it-yourself" construction. The blocks have structural qualities superior in many ways to burned brick and other masonry materials. Cinva-Ram blocks cost only about 1/20th of the price of conventional building blocks if made by the user.

Enrique E. Danies, Metalibec S.A., Apartado Aereo 11798, Bogotá, Colombia.

### Cold cement

Laboratory investigations involving intensive grinding of various mixtures of ordinary clays and lime have shown the possibility of producing cements equivalent to Portland Type I. The cements produced are cheaper to make than Portland Type I because the process equipment is very simple and the expensive heat treatment step is eliminated. A wide variety of common clays are usable. Hence, many countries which do not have the plant resources for manufacture of portland cement can now produce cement of adequate quality by using simple processing equipment.

P.K. Mehta, Department of Civil Engineering, University of California, Berkeley, California, U.S.A.

# "We in Bangladesh serious crisis...at a short by about 3

"We face a state of economic collapse. Our entire communications system, housing, our villages, and in fact, even our agriculture was practically destroyed. We have to start almost from scratch."

With these words, Dr. S. D. Chowdhury, of the National Planning Commission for the Agricultural Development Division of Bangladesh opened his address to the Eighth Asia/Pacific Food Production Conference recently, in Seoul, Korea. In his address, he

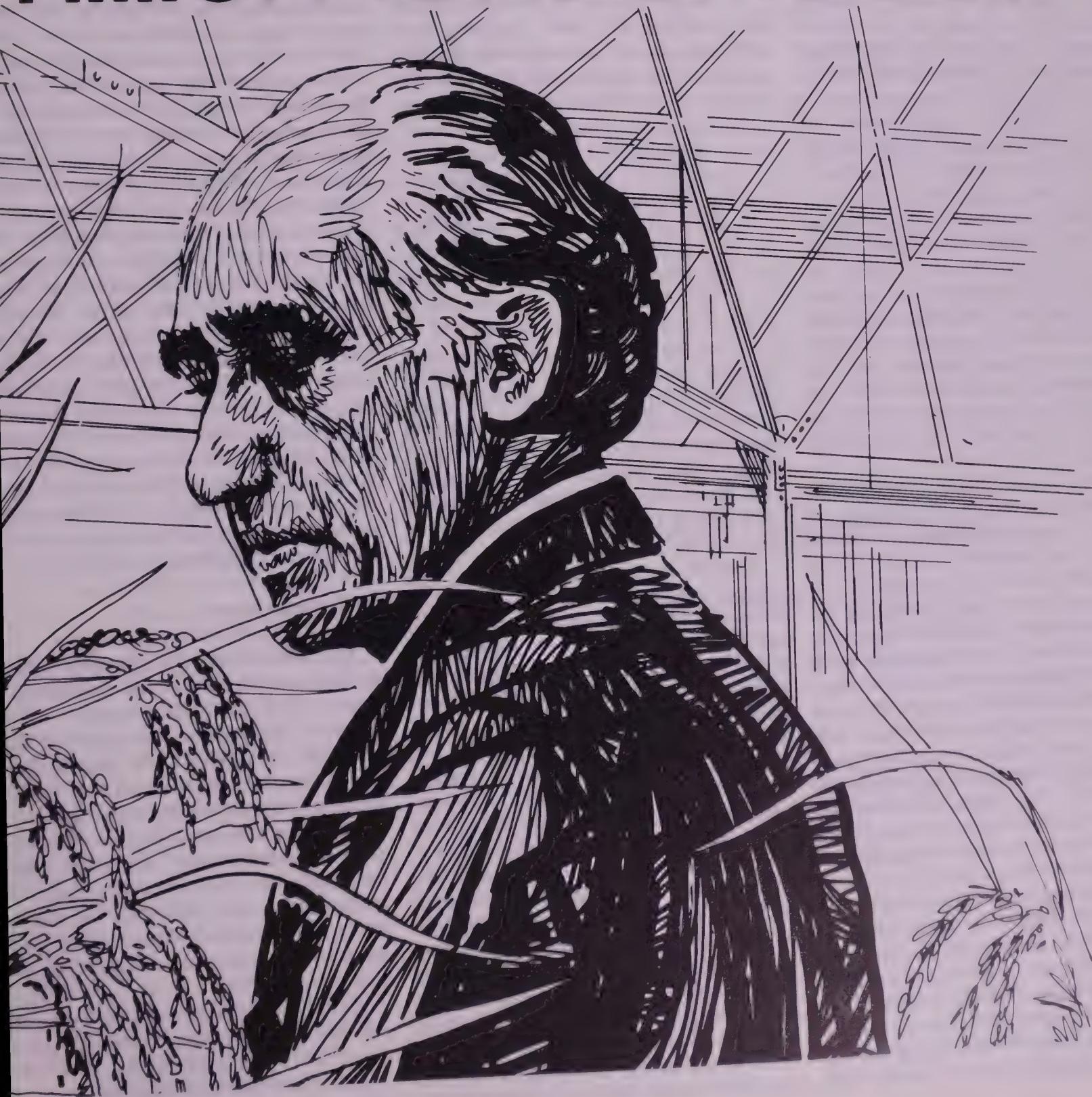
spoke of the development of new rice strains that would respond to the unique land and climatic conditions of Bangladesh.

The World Food Production Conferences are sponsored by International Minerals & Chemical Corporation to provide an international platform for advancing new approaches to worldwide food sufficiency. For additional information, write IMC, Libertyville, Illinois 60048, USA.

## WORLD FOOD PRODUCTION CONFERENCES



are facing a really  
time when we are  
million tons of food."



# Changing Badeku

by A.U. Patel

The Department of Agricultural Economics and Extension of the University of Ibadan, Nigeria, does not believe in the existing apparent isolation from the surrounding society and economy. It aims to integrate agricultural research, education and extension as an essential step toward a rapid and enduring impact on agriculture. A beginning was made in this direction in 1970 by starting a pilot project in Badeku village, situated 17 miles from the campus in Ibadan east division. The population of Badeku is about 1 300 with 275 households.

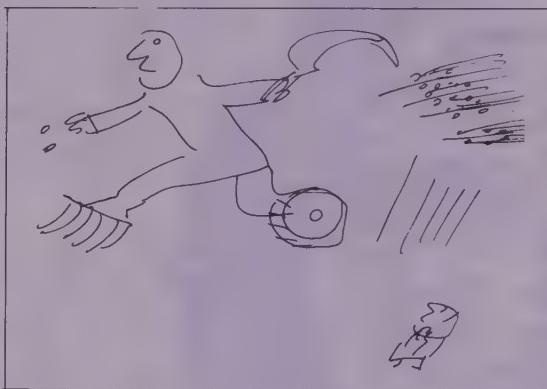
The principal objectives of the village project were: to provide the students of agricultural extension and faculty researchers with a laboratory type situation in which they can observe and practice communication processes, extension methods, programme planning and evaluation techniques; and to determine and deal with the needs and problems of farmers for improving important farm enterprises.

The main activities during the first year of the project were: (1) mapping out the village residential area; (2) socio-economic and agricultural survey of the village (all households) to serve as a bench mark and to aid in analysing the present situation; (3) mass-vaccination against cholera; (4) demonstrations on boiling drinking water to prevent cholera; (5) demonstration on the use of fermentation trays for cocoa beans, preparing a new recipe, for using maize, and result demonstrations on maize; (6) field day on the maize demonstrations plot; and (7) field trip by about 40 farmers and five women who visited the University farm at Abadina.

After seeing the result demonstration of the early maize crop, 37 farmers purchased 175 lb of improved seed of maize and 15 farmers purchased 500 lb of fertilizer for the late crop of maize to be planted in August 1971. Some farmers paid in advance for the seed and fertilizer and the remaining paid on delivery. The

bench mark survey revealed that only eight farmers had previously used improved seed and fertilizer for maize. Compared to this figure the impact of the first demonstration was remarkable.

It was pointed out to the farmers that their demand for seed, fertilizer, and chemicals would increase and the Department could not arrange for their purchase and distribution in the future. An



organization of interested farmers buying and distributing supplies was proposed. Realizing the importance of this suggestion, they formed the Binukonu Cooperative Society with 81 members in June 1971.

The late maize planted during the first year, in August 1971, was harvested in December 1971. The demonstration showed that the farmers can increase the maize yield four times by using the improved seed, fertilizer and other practices as compared to the local variety without fertilizer.

The survey showed that 97 percent of the farmers planted maize with cassava and cowpea on heaps. In spite of seeing two demonstrations of the mono-crop of maize planted on flat, most of the farmers said they would continue to grow maize with cassava. Therefore, a demonstration of early maize was planted with three treatments: maize alone on flat, maize and cassava on flat, and maize and cassava on heaps. The data will be analysed after harvesting both the crops.

After seeing the possibility of increasing the maize yield significantly, the

farmers wanted to increase their maize acreage and use fertilizers, insecticides and improved seed. However, they said they did not have adequate financial resources to purchase the inputs. They also wanted money to clear the land and for spraying chemicals on cocoa trees which is their most important cash crop.

The villagers met with officers of the Western State Agricultural and Industrial Investment Corporation (WAIIC) (a semi-governmental organization) for credit. WAIIC was willing to give credit on conditions that the farmers form a cooperative or a form of business company; use the recommended package of improved practices for maize and cocoa; and sell their cocoa beans only to one licensed buying agent who must agree to deduct the amount owed on the loan from the value to farmers' cocoa sales, and pay this amount directly to WAIIC. Accordingly, most of the members of the Binukonu Cooperative Society formed the Badeku Agricultural Production and Supply Company (BAPSC). Initially there were 42 members, but after a few months the membership increased to 70.

## **The farm plan**

The field assistants of WAIIC prepared the farm plan for all the 52 members and studied their credit requirements. The executive committee of BAPSC scrutinized the credit demands of all the members and submitted their report to WAIIC which approved the loan in May 1972.

The loan was used for the following purposes: purchase of fertilizers, plant protection chemicals and improved maize seed; construction of a crib for storing maize; construction of a storehouse for cocoa; and cash loans to members for hiring farm labour.

A study is being conducted to find out how many farmers adopted the package of improved practices for maize and cocoa; the socio-economic and personal characteristics of the farmers who adopt

d the package of improved practices; and the problems involved in the use of the cash loan given to farmers.

The members of BAPSC decided to grow maize cooperatively on a group farm by adopting the full package of practices. They requested a few members to give their land to BAPSC for one year to grow maize, and these members gave 3.9 acres of land at one place. The maize was planted in March 1972. All operations from clearing the bush to harvesting were performed cooperatively by group labour. Planting, fertilizing, spraying, weeding, etc., were carried out as per the recommendations.

The yield on the group farm was 2 680 lb per acre as compared to the average yield of about 800 lb per acre in the state. The farmers are accustomed to consuming white maize in their diets. When they purchased and grew 400 lb of seed of the improved variety with yellow colour in the early season of 1972, some doubt was expressed that the crop could be sold in the local market. However, no problems arose. The produce harvested by individual farmers was consumed by them or sold in the local market without difficulty.

A serious problem developed, however, in selling about four tons of maize harvested from the 3.9 acres of group farm. There was no demand for such a great quantity in the local market and the farmers had no facilities for drying and storage. The merchants and poultry farmers in Ibadan city were not ready to buy because they lacked driers. Sun-drying was not possible in August because of the rains and the cloudy atmosphere which would last until the end of October. The merchants and big poultry farmers indicated they would buy all available yellow maize in November. To solve this problem the farmers were directed to the Nigerian Stored Products Research Institute (NSPRI), which advised the construction of a crib for storing the maize cobs immediately after the harvest and demonstrated how to do this. The farmers then constructed a crib by using mostly local materials and stored the cobs during the second week of August 1972, with the application of suitable insecticides.

Cocoa is the important cash crop in the village. The Badeku villagers pre-

viously sold to private merchants. However, most of the farmers were not satisfied because they thought they were being cheated in weighing and grading. The members of BAPSC therefore decided to sell cocoa through the Western State Farmers' Union, which agreed to open a cocoa subgrading centre in Badeku to save transportation costs for the farmers. BAPSC is presently constructing a building to serve as a store and grading centre. The economic impact of this marketing arrangement will be studied when most of the cocoa will have been sold.

The farmers usually kept their land under fallow for about two years after two years of cultivating crops like maize, cassava and yams because of the decrease in soil fertility. It might be possible to avoid land under fallow by using fertilizers and rotating maize, cassava or yams with suitable legume crops. However, a suitable legume crop was lacking. Since the farmers did not grow legumes to any large extent there was also deficiency of protein in their diets.

The International Institute of Tropical Agriculture (IITA), Ibadan, has been conducting trials on cultivating different types and varieties of legumes. Soybean was found quite promising, and with the cooperation of IITA scientists cultivation

of soybean was demonstrated on a 600 square foot plot. A demonstration on preparing a recipe from soybean was also conducted by a home economist. Even though soybean was a new food item for the villagers, they liked its taste. However, it took a long time to cook. Efforts are being made to reduce the cooking time of soybeans.

These are some of the changes which have been initiated during the two years of the pilot project in Badeku. The fact that the adoption of improved seed and fertilizer for maize cultivation increased from three percent to 26 percent of the farmers in a remote village like Badeku within 18 months indicates that farmers are willing to use the improved agricultural practices provided they are educated and guided properly in procuring and using the credit, seed, fertilizer, storage and marketing facilities at the right time.

The villagers have developed self-confidence in organizing their activities. Local leaders with a progressive outlook are emerging. These changes should serve as the foundation for sound agricultural development in Badeku.

*A.U. Patel is Senior Lecturer in Agricultural Extension in the Department of Agricultural Economics and Extension, University of Ibadan, Nigeria.*

## Hidden employment

By Allen LeBaron and Morris Whitaker

The need for a viable rural absorption policy confronts all members of the Third World. This has become increasingly apparent since the second world war, as the manufacturing sector in many less developed countries experienced a reduction in its capacity to create employment. Apparently this reduction was mainly due to policies that cheapened capital while making labour dear. During the same time period rural-urban migration increased substantially. With restricted job opportunities in the high-wage industrial sector, the bulk of these migrants either remained unemployed or accepted nonindustrial, nonagricultural (tertiary sector) work.

Any practicable labour absorption policy will have to take into consideration

the "why" of people moving to urban areas at high rates even when prospects for industrial employment are dismal. In our view, some of the best publicized research on this question gives only incomplete answers.

For example, economists Michael Todaro and John Harris have tested suppositions about causal variables in rural-urban migration flows in certain countries. In general their models lead to the conclusion that wage and employment policies to reduce migration by making farm living more attractive hold the best hope for the overall employment situation. And, of course, the opposite would then be true: programmes to increase employment in urban areas will exacerbate the migration problem. Such research re-

sults have precipitated a variety of policy prescriptions, mainly directed toward agriculture. Carl Eicher and others argue that employment problems in Africa can be alleviated by policies applied to the agricultural sector, while William Thiesenhusen suggests for Latin America that where a *minifundio-latifundio* tenure system is in effect, massive land reform will solve the employment and income distribution problems.

Too much emphasis on tying unemployment solutions to the rural sector, however, may lead to an even worse distribution of resources than at present exists. This seems like such an obvious possibility that we wonder if some explanation for the current policy recommendations cannot be found in the choice of labour migration variables studied? In both Todaro's and Harris's studies there is an effective separation of the urban labour force or economy into two groups or parts. One is the modern and the other is the traditional labour sector. Rural-urban migration is treated as a function of the difference between labour productivity in agriculture and an expected urban income that is tied one way or another to the modern sector. This seems to suggest that a "favourable" productivity or wage difference, between the urban *traditional* sector and the agricultural sector, is not likely to occur. Thus, migrants who do not obtain employment in the modern sector are assumed to add to unemployment or underemployment.

Actually we are quite ignorant about the role of the traditional or tertiary sector in labour absorption, and about the links between this sector and the rural labour market. It seems likely that the rate of rural-urban migration is determined by the total probability of getting some kind of urban job and a difference between wages in agriculture and in the particular urban sector where the employment opportunity finally occurs. Whether or not a "favourable" differential often exists with respect to the nonindustry sector is an empirical question. However, the rapid rates of rural-urban migration in many countries and the decreased capacity of industry to absorb labour imply that migrants may have a high expectation of obtaining nonindustry employment at a higher real wage than they realized in agriculture.

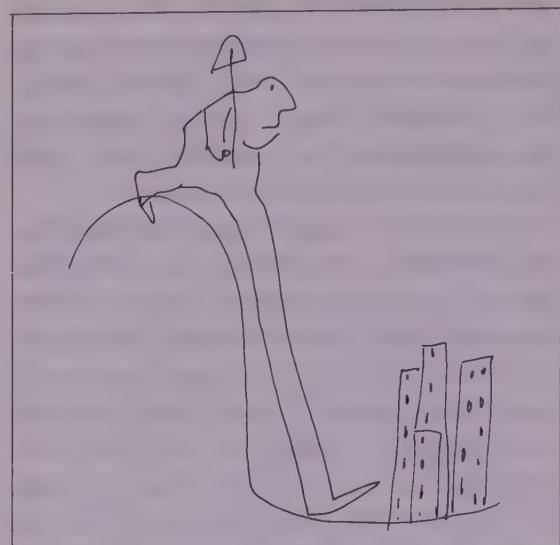
Some general results from research on the Brazilian labour market lend credence to this notion. The average internal income per economically active person in the tertiary sector was two to three times as great as in agriculture in 1960. When one considers that migrants have gained access to public education

to keep labour "down on the farm" may lead to an inefficient solution in terms of labour resource allocation. The real wage is highest in industry, and appears to be next highest in the nonindustry urban sector, and lowest in agriculture. Over time, the wage differential has evidently narrowed between agriculture and the nonindustry urban sector as migration has occurred, but has widened between agriculture and industry, and between the nonindustry sector and industry.

Employment policy recommendations of the public works variety for agriculture could lock up farm labour that through migration, might earn a higher wage in the nonindustrial sector. The general policy mix implied by these arguments would involve removing barriers to entry to industrial jobs and raising rural wages through increased productivity in agriculture. The result might well tend to encourage rural-urban migration and require a parallel assessment of increasing urban social costs. The point is that the policy emphasis each wage sector receives in a given situation must be grounded on factual knowledge.

Whether or not the nonindustry urban sector provides substantial employment at a higher real wage than can be obtained in agriculture for a majority of rural-urban migrants is the crucial issue. This is a question that needs to be answered for developing economies that are experiencing employment problems coupled with rapid urbanization.

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for their children, and to subsidized medical and dental services, the differential is probably much wider.

Another variable may also be important in explaining rural-urban migration. Many migrants retain ties to the rural areas and reap some income and transfer security from those ties. In some cases such linkages may be of prime importance in explaining rural-urban migration. When transfer security is high, migration may occur at a rapid rate even if the immediate probability of obtaining work is low.

Other results from research in Brazil suggest why the general policy of trying

## Group therapy

by Bala Chandran

In land hungry, densely populated Asia, Malaysia stands out as a paradox, with millions of acres of untouched, rich cultivable land beckoning to be tilled.

To be precise, there are 37.9 million acres of land suitable for agricultural uses, and the Government has embarked on a programme to develop and settle these lands.

The entire process is aimed at integrating agriculture and modern activities in commerce and industry. This involves

the restructuring of society, i.e., the establishment of fully integrated townships in the countryside to arrest urban drift and to encourage a movement of city dwellers to the less developed areas, making available valuable expertise for the development of the *ulus* or rural areas. Under the Second Malaysia Plan (1971-75) over one million acres of land are to be developed, more than twice the acreage developed during the First Plan.

The Federal Land Development Authority (FLDA) is the single most important land development agency in the country. It is scheduled to develop 55 000 acres and settle 23 000 families annually, compared to a total of 20 700 families settled by the authority in the first 15 years since its establishment in 1956. By 1972, FLDA had planted 308 420 acres — 147 825 under rubber and 160 595 under oil palm. Last year it produced 79 000 tons of rubber, and 168 000 tons of oil palm and 18 000 tons of oil palm kernels. It also carries out processing and marketing of these products, and now it is planning to go into sugarcane cultivation to reduce the local unemployment problems.

Under its land development and settlement schemes, holdings are apportioned very carefully to peasants. The most preferred are those who are landless, "within the age range of 25 to 35, with a large number of dependents, having additional skills, enthusiasm and determination to work hard." Owners of less than two acres of land are also considered.

Each settler is allotted a total of 10½ acres — a quarter acre for a house lot, eight acres for a main crop and two acres for subsidiary crops. On the average, each FLDA scheme covers 5 000 acres with a population of 2 500. An area of normally between 1 000 to 1 500 acres is set aside as reserve for future expansion to accommodate increases in population.

The settlement schemes are developed by contract labourers. They clear the land, lay the roads and plant the crops. The settlers move in only when the village infrastructure, such as cooperative shops, clinics, schools and police posts, is ready. It takes about one year and nine months from the time the first chunk of earth is moved by the tractors to the time the settlers move in.

By the time the first settlers enter, the main crop is about six months old and easily manageable. As soon as the settlers move in, they plant their quarter acre house lots with vegetables and fruits for their own consumption. They also rear poultry and livestock. Birds and animals are distributed under a subsidized scheme. Freshwater ponds, sometimes artificially created, are also immediately stocked with fish. The idea is to make the settlers self-supporting and self-suffi-

cient at least in their food requirements. At the same time foodgrains and other necessities such as milk, given by the World Food Programme, are sold to the settlers at a rate greatly below the market value.

It takes several years for the main crops to mature — six years in the case of rubber and four years for oil palm. Until then, there is no substantive income for the settlers except what they get from the cash crops on their plots and poultry and cattle. In view of this, a subsistence allowance is paid. Payment is based on the number of days' work done by each settler and his dependents. If a settler is temporarily incapacitated due to illness or disablement, or if he is otherwise prevented from working, he is given a direct loan which he has to repay once his plot becomes economically viable.

#### **A block within a block**

The block group method of work is used in the farm operations. A group of 15 to 25 settlers is allotted a block of about 120 acres to work on. After the third year of planting, each settler is allocated his individual lot (in the case of rubber) of about eight acres, i.e., within the block in which he had worked. "This method," says an FLDA official, "while instilling a community spirit and ensuring good agricultural practice, keeps alive the settlers' incentive for work since each of them is sure of the area within which his lot will be located."

Repayment of loans is tied to ability to pay and income from the crops. As the rubber and oil palm yields increase sharply a few years after commencement of production, the amount of repayments of the loans also goes up. On the completion of the loan repayments, which normally takes 10 to 15 years, the settlers are given titles to the holdings for a term usually of 99 years.

In many FLDA schemes, settlers' earnings are well above the average income of Malaysians. Only about two percent of the settlers drop out, mainly due to an inability to adjust to the tough life and discipline on a land development scheme. Ironically, many of the dropouts seek to regain admission to the schemes after finding that life in the kampongs (villages) is even tougher than in the schemes.

Although the schemes are run by highly trained and skilled managers, there are settlement committees which look after day-to-day matters and human problems, such as marital difficulties, etc. These committees are elected by the settlers themselves.

One of the problems facing the managers of the schemes is to get the settlers to save and set aside some money for a rainy day. But the tendency is to spend on such nonnecessities as radiograms and TV sets. Many have become proud owners of cars and this instead of helping them to improve their income is doing the opposite — — what with too frequent visits to the towns and cities in search of diversions.

In an effort to halt the negation to the gains, the FLDA is now promoting giant land development schemes, covering as much as 250 000 acres complete with modern towns, offering the best in entertainment, recreational facilities and social amenities. One such scheme is the Jengka Triangle in the state of Pahang. It will have a major regional town and two subsidiary centres when fully developed. The project will have 23 villages with a population of 100 000.

A weak link in the drive to obtain better returns from the country's agricultural produce is that too much attention is paid to research aimed at increasing yields and not enough research is conducted into finding new uses for the commodities. Demand, however, has been growing in the Malaysian Parliament for existing research organizations to pay more attention to finding new uses for the main products.

Recently, the Food Technology Division of the Ministry of Agriculture and Fisheries succeeded in producing powdered milk from palm oil. This major breakthrough could serve as a big boost to the palm oil industry.

Planters' associations in the country have been urging the Government to make greater use of rubber, for example, in making rubberized roads. The associations argue that if every mile of road in the country is rubberized, demand for the commodity will increase manifold.

Bala Chandran is a journalist who represents a number of overseas news organizations in Kuala Lumpur.

# Announcements of vacancies

## in the Food and Agriculture Organization of the UN

**Post title - SOIL CONSERVATION PLANNING,** Irrigation and Conservation of the Bio-Bio River Watershed (Project No. CHI/71/549). **Vacancy No.** 798-AGL-105. **Duty station - Los Angeles, Chile.** **Duration - 36 months.** **Starting date -** as soon as possible. **Background Information -** The purpose of the project is to assist the Government in initiating an action programme for on-farm development and conservation in a selected irrigated area and associated non-irrigated lands in southern Chile. **Duties -** Under the supervision of the Project Director, the post incumbent will: Plan, organize and guide soil conservation farm planning activities within the Soil and Water Conservation Technical Assistance and Advisory Service to Farmers being implemented by the project. Cooperate in the development of recommendations and guidelines for conservation and irrigation farming

in the region of the project. Guide the establishment of improved conservation and soil management practices on farms. Investigate soil erosion problems in the watershed of the Bio-Bio River. Recommend research in erosion control and cooperate with other project experts in its implementation. Train local personnel. **Qualifications -** University degree in Soil Science, General Agronomy or related fields. **Experience -** At least eight years' experience in the planning and application of soil conservation farming practices. Experience with irrigation desirable. **Languages -** Spanish, English desirable. **Emoluments -** Salaries and benefits are liberal, commensurate with the responsibilities of the post and in line with the depth and breadth of training and experience.

**Post title - SOIL CONSERVATIONIST,** Irrigation and Conservation of the Bio-Bio River Watershed (Project No. CHI/71/549). **Vacancy No.** 922-AGL-113. **Duty station - Los Angeles, Chile.** **Duration - 36 months.** **Starting date -** April 1973. **Background Information -** The purpose of the project is to assist the Government in initiating an action programme for on-farm development and conservation in a selected irrigated area and associated non-irrigated lands in Southern Chile. **Duties -** Under the supervision of the International Director, the post incumbent will: Plan and organize the advisory, educational and divulgation activities of the Soil and Water Conservation Technical Assistance and Advisory Service to Farmers. Guide in the preparation of news releases, pamphlets and bulletins on subjects relevant to the project for release to farm-

ers. Cooperate in and lead the preparation of recommendations and guidelines for irrigation and conservation farming, including soil management and fertilization. Suggest research projects. Organize and guide short courses, seminars and in-service training activities. **Qualifications -** University degree in Soil Science or related fields. Post-graduate study and farming desirable. **Experience -** At least seven years of experience in agricultural extension or similar activities. Experience as extension soils or soil conservation specialist and in soil conservation technical assistance programmes is desirable. **Languages -** Spanish. **Emoluments -** Salaries and benefits are liberal, commensurate with the responsibilities of the post and in line with the depth and breadth of training and experience.

**Post title - TECHNICAL OFFICER (SOIL DEVELOPMENT),** UNDP/Large-Scale Project, Improved Soil Fertility and Management in the Pampa Region (Project No. ARG/29). **Vacancy No.** 583-AGL-87. **Duty station -** Balcarce, Argentina. **Duration -** 20 months. **Starting date -** as soon as possible. **Background Information -** The purpose of the project is to assist the Government in coordinating research work on soil fertility and management in the Pampa Region, west and south of Buenos Aires, and in disseminating the results to farmers through the Extension Service. **Duties -** Under the supervision of the Project Manager, the post incumbent will: Carry out in close cooperation with the counterpart staff a soil development programme in the project area as a whole and in pilot

areas such as the one at Olavarria. Participate in the courses organized by the project with a view to training new local staff in soil development and extension work. Train interregional extension agents in soil management practices, such as land preparation, soil conservation measures and efficient use of fertilizers, etc. **Qualifications -** University degree in Soil Science with specialization in soil development work. **Experience -** At least seven years of experience. Extension experience desirable. **Languages -** Spanish, English desirable. **Emoluments -** Salaries and benefits are liberal, commensurate with the responsibilities of the post and in line with the depth and breadth of training and experience.

**Post title - PROJECT MANAGER,** Establishment of a Soil Conservation Programme (Project No. ARG/70/526). **Vacancy No.** 748-AGL-97. **Duty station -** Paraná, Province of Entre Ríos, Argentina. **Duration -** 24 months, proposal for 2-year extension. **Starting date -** as soon as possible. **Background Information -** The purpose of the project is to assist the Government in the implementation of a national Soil Conservation Programme through the establishment of a Soil Conservation Research Centre and the operation of a Soil Conservation demonstration area. **Duties -** The post incumbent will: Be responsible for the detailed planning, administration and execution of the project. Supervise the experts and coordinate the work of the project team. Be responsible for all material, equipment and transport, and the local disbursement of any funds

furnished to the project by the Executing Agency. Control the use of land, buildings, equipment and materials, supplies and other property belonging to the Special Fund. Be responsible for such procurement activities as delegated to him by the Executing Agency. Be responsible for preparing the final report on the project. **Qualifications -** University degree, with specialization in Soil Conservation. **Experience -** At least ten years' experience in soil conservation. **Languages -** A good knowledge of Spanish with a working knowledge of English or French. **Emoluments -** Salaries and benefits are liberal, commensurate with the responsibilities of the post and in line with the depth and breadth of training and experience.

**Post title - COMMODITY OFFICER, P-3,** Basic Foodstuffs Service, Commodities and Trade Division, Economic and Social Policy Department. **Vacancy No.** 458 ESC. **Duty station -** Rome. **Duration -** Type of appointment: Fixed-Term of 3 years. **Starting date -** as soon as possible. **Duties -** Under the general supervision of the Senior Commodity Specialist of the Service and through the FAOWFP liaison officer of the Area Services Division the post incumbent will: Undertake technical scrutiny, economic research and analysis of commodity aspects of World Food Programme projects and proposals, and particularly of their implications for domestic markets and international trade. Participate in interdivisional meetings on WFP projects and where necessary assist in drafting commodity notes on food supply, stock and surplus position and outlook, as requested by the World Food Programme. Participate in field missions and project preparations as requested by WFP. Supervise preparation of the Quarterly Food

Aid Bulletin and monthly summaries of the Early Warning System for Food Shortages. Perform related professional duties, as assigned, and in particular those requested by WFP. **Qualifications -** University degree in the field of economics. **Experience -** Five years' experience at the professional level in economic research or outlook studies, preferably related to agricultural commodities with emphasis on the international aspects. Good knowledge of economic problems of developing countries. Proved ability to draft lucidly, and ability to work to deadlines. Ability to develop and maintain working relations with officials and experts in governments and other international organizations, and in trade and professional associations. **Languages -** Very good knowledge of either English, French or Spanish and a good working knowledge of one of the other two. **Emoluments -** Salaries and benefits are liberal, commensurate with the responsibilities of the post and in line with the depth and breadth of training and experience.

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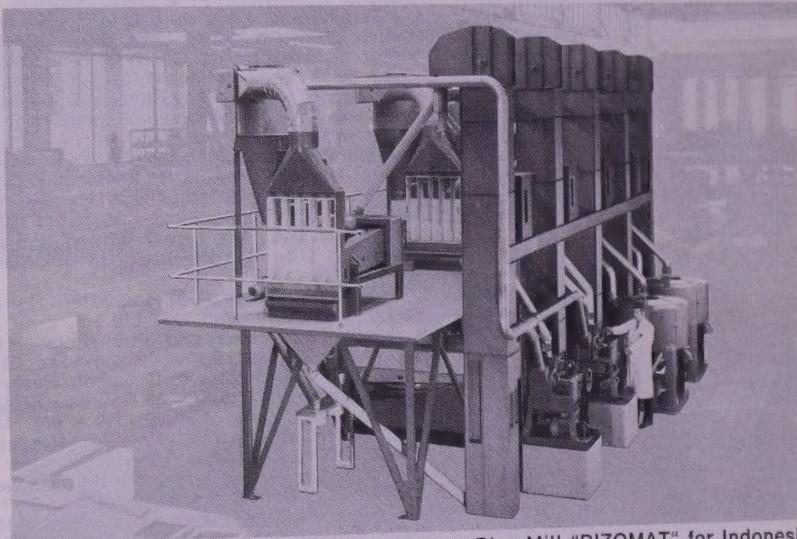
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